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Pearson, O. P.

1964 - 1965

Catalogue

4511 - 4547

Argentina

Pearson
1964

catalog

mar de Colo, 25 km. NNE mar del Plata, Buenos Aires

4511 ♀ *Ctenomys*

207 x 52 x 26 x 5 Vag. abierta,
peneo 2 derecho 2 iz., 30 mm. CR.
cada ovario con 2 corp. lnt. amarillo y foll. med.
~~Suelo ejempl.~~ Cran. y hum. y fem.

Oct. 4

25 km. S. Azul, 1000 ft., B.A. Province, Argentina

4512 ♀ *Reithrodontomys* (juv.)

150 x 53 x 26 x 17 ut. immature.

4513 ♀ *Oryzomys*

220 x 91 x 29 x 18 not preg.

4514 ♂ *Abodon* *agare*

162 x 70 x 21 x 13 test 8, SV 9

4515 ♂ *Abodon*

156 x 66 x 19 x 12 test 7, SV 3

4516 ♂ *Galea*
~~*Microtus*~~

195 x 70 x 26 x 19 test 16, SV 25

4517 ♀ *Galea*
~~*Microtus*~~

225 x 10 x 42 x 22 | 2 fetuses at birth
6 mm CR, white
cheese milk bon

30 km S. Azul, Buenos Aires Prov. Argentina

35 km S. Azul, 1000 ft ±, Buenos Aires Prov. Oct. 5.

4518 ♀ pale *Abodon*

164 x 73 x 22 x 14 uterine scars

4519 ♂ dark *Abodon*

160 x 74 x 21 x 12 test 6, SV 3

4520 ♂ pale *Abodon*

168 x 79 x 23 x 14 test 7, SV 4

4521 ♂ dark *Abodon*

156 x 72 x 20 x 13 test 5 1/2

4522 ♂ *Oryzomys*

228 x 93 x 29 x 17 test 10, SV 10

4523 ♂ "

235 x 94 x 31 x 17 test 10 mm. SV 7

Boinacio, Buenos Aires Prov., Argentina, Oct 18.

4524 ♂ *Abodon*

175 x 74 x 22 x 14 1 meter from 4525
37g. test 10 mm.

4525 ♂ *Abodon*

168 x 66 x 21 x 12 29g. test 9 mm

4526 ♂ *Ctenomys*

261 x 62 x 38 x 7 250g. T 15, SV 20
same case as a female yesterday (Rig) the one
with skin not saved (preg).

Punta Lara, Buenos Aires Prov.

Nov. 7

4527 ♀ *Abodon* *hampi*

170 x 77 x 22 x 13

20g. 4 bumps
emb.

Pearson
1965

30 km W. Plaza Huincul, Neuquen, Argentina
Jan. 13

4528 ♂ *Echymipeta*

186 x 103 x 22 x 18
sandy stony desert + bushes.

4529 ♀ *Akodon longipilis hirta*

177 x 71 x 24 x 13 lactating
damp forest edge of lake

4530 ♂ *Phyllotis micropus*

210 x 93 x 27 x 18

bushes filled

30 km S. San Martin de los Andes
Jan. 14

30 km S. San Martin de los Andes (Lago Meliquina)

Neuquen, Argentina

Jan. 19

Natonomys macromys vestitus

4531 ♂ 167 x 52 x 26 x 18

51 gms.

forest edge of lake
testis 8 mm.
stomach

4532 ♂ *Akodon longipilis hirta*

182 x 74 x 24 x 15

48 gms
forest edge of lake

7 km NW Zapala, Neuquen, Argentina

Jan. 20

4532 ♂ *Phyllotis darwini*

229 x 104 x 28 x 27

testis 12 mm.

60 gms
shale - desert

4533 ♀ *Marmosa*

171 x 85 x 13 x 15
19 gms

shale - desert

4534 ♀ *Elignodontia*
4 emb.

178 x 95 x 21 x 16
shale-desert 22 gm.

4535 *Akodon* sp?

165 x 65 x 22 x []
shale-desert 31 gms.

93 km S. Malargüe, Mendoza, Argentina
Jan 22, 1965

4536 ♂ *Phyllotis darwini* var. *vestitus*

275.135.29.29

testis 13

87 gm

stomach w coarse green, smelly vegetation in lava field

4537 ♀ *Phyllotis darwini* var. *vestitus*

261.134.29.29

parous

65 gm.

same rock as 4536

4538 ♀ *Phyllotis*
parous

248.126.27.27

48 gm
lava field

4539 ♀ *Elignodontia*
preg. 3 emb.

159 x 84 x 21 x 19

17 gm
lava field

22 km NE Tinogasta, Catamarca, Argentina
Jan. 25

4540 ♀ *Phyllotis*

236 x 120 x 25 x 25 67g.

La Moya, 45 km SE Bell Ville, Córdoba
March 1, ~~Feb 29~~, 1965

4541 ♀ Calomys 156 x 76 x 17 x 13 21g. ^{3 emb.}

4542 ♂ akodon 152 x 68 x 18 x 14 15gms.

4543 ♂ 150 x 70 x 18 x 14 17g
 testis 7 mm.

March 3, 1965

4544 ♀ akodon ^{interns fluidy, catrous?} 158 x 72 x 19 x 14 18g.

4545 ♂ 177 x 69 x 22 x 13 36g.
 testis 11 mm

4546 ♀ Calomys 120 x 49 x 16 x 12 24g.
 7 emb.

4547 ♀ myotis ^{no emb.} 106 x 39 x 10 x 13 14g.

Pearson, O. P.

1964 - 1965

Journal

Argentina

Pearson
1964

Mineá, Buenos Aires City, Argentina
Sept. 14, 1964

- Sept. 14 Put 50 museum specials with corn meal at dusk along a low dike upstream from the new biology building. Lush burr clover and grasses. No runways seen. Temp. warm, light breeze. Carol saw Norway rats along the big cement pond.
- Sept. 15 at 6:30 a.m. warm & clear. Traps held 13 Abodon and 1 Oryzomys. Almost all of them near refugia of some sort (disturbed logs, piles of rocks or cans etc.).
- Sept. 16 Rain last night. Set 60 museum specials in Mineá, same line as before plus 3 other short lines. Set at 5 p.m. Corn meal. Sunny, warm.
- Sept. 17 night clear, morning warm & sunny. at 7 a.m. traps held 12 Abodon and 2 Oryzomys.
^{mar de} Rio Colo, 25 km NNE near del Plata, Buenos Aires Prov.
- Sept. 19 Left 6:30 a.m. with Collo, Busch, Liontendon, and Gallepin to locate a tree - breveretia area and to catch some Myndelphina. With guidance from Goble we looked first a few hundred yards to the north of the previous trapping place at Santa Clara del Mar (Playa Corbas or Corbinas). No houses, and looked fine except not many trees and most of it had been burned. We then drove further north and looked at another place a few km. north (F.I.N. Soc. Aram.) a big real estate development ~~but~~ with "streets" marked but no houses. Good vegetation but not many trees. Then to Rio Colo where there is a small motel near the beach, fair vegetation and

~~but sleep~~

fair trees abundance. Then to Mar Chiquita where there are lots of trees, but much planting of acacias on the dunes and signs of heavy usage by people. Returned to Colo at 5:15 and set about 56 ~~murres~~ shermans, some with cheese, some Quaker, some fat, and some sausage. The habitat rather rich bushy areas, some ~~bushes~~ low bushes, grazed green grass in between bushy areas. Also 10 shermans in pure beach grass near our tent. Weather foggy + light wind, moon almost full

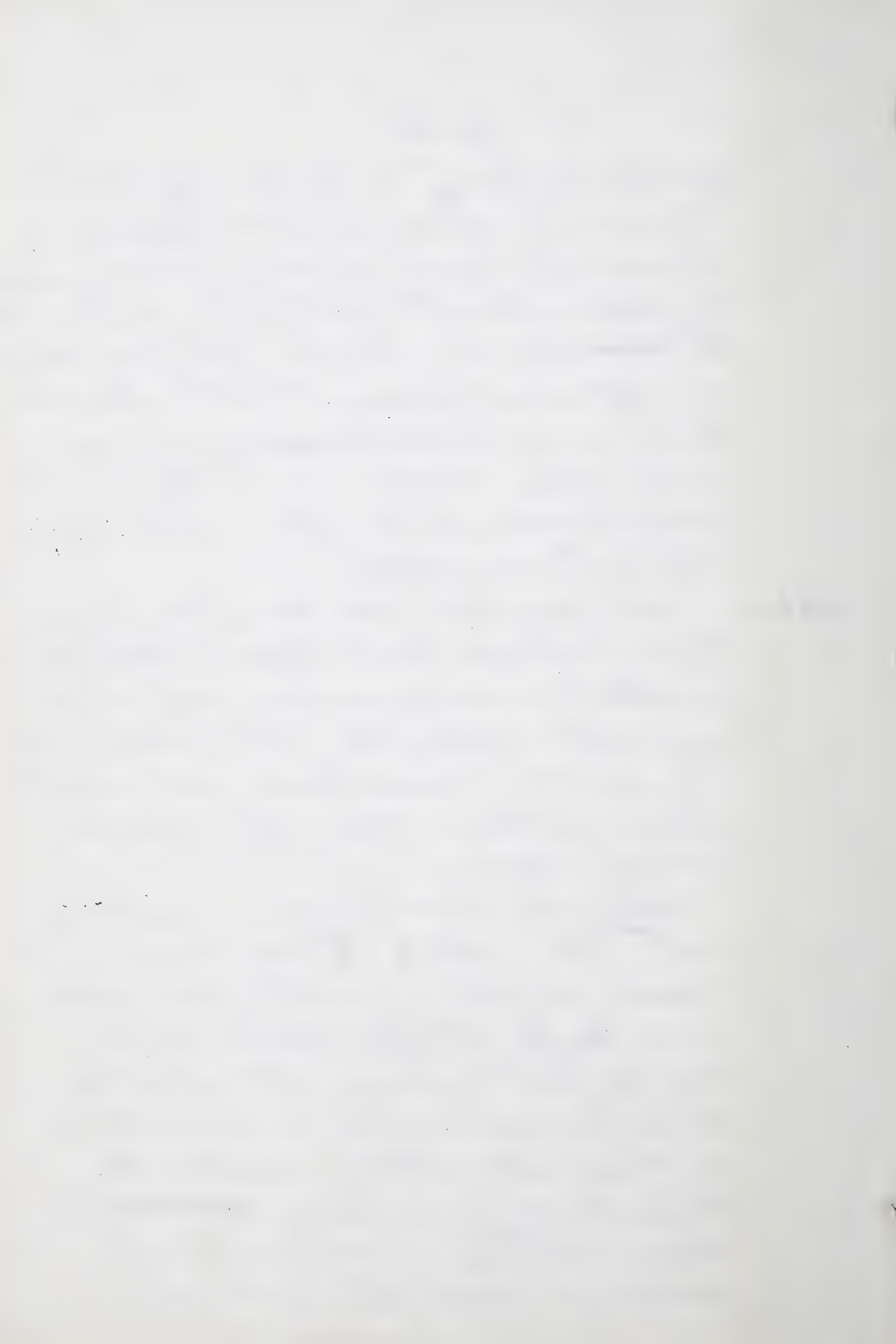
Sept. 20

morning clear for about 5 minutes at 6:30, then fog again. Traps in bushy areas had only 2 Abodon. Looked like a couple of viscacha burrows there. Traps in beach grass caught 2 Abodon also. Set 1 more about 7 a.m. and 8 museum specials around a small island of cortadera. These caught 1 Tino and 2 Abodon before 9.

Walked about 2 km. N looking for a good tree area. Terrain excellent but trees scarce.

Caviar + taxes + fees. Drove about 10 km north of Mar Chiquita, but nothing looked good. Back to Mar del Plata where we met Big Contreras, and Gabriel Escobier and they convinced us that we should head south with them along the coast.

Stopped at many places between ~~Viedma~~ ^{arroyo La} Miramar and ^{La} Mala Cara (more than half way to Neuquen from Mar del Plata), but no trees.



Drove back to ~~Mar del Sur~~ ^{Mar del Sur} where, just before dark I set 35 shermans in thick grass around a swale along the road. Spent the night in a house in ~~Mar del Sur~~ ^{Mar del Sur}.

Horreos ~~nesting~~ nest-building everywhere. Chimangos courting. Saw lots of good two-weavers - but without weas.

Sept 21. 2 akodons in my traps. morning foggy. Drove north along the coast, stopping to look for two-weavers at Va. Besell (too many people, doves too loose? for many trees, although lots of trees on the shoulders of the roads etc.), Osterde, Pinaros etc. By far the best place was at Valeria del Amor, a little south of Pinaros. Huge dense-plantings of acacias, pines etc., near Pinaros - Osterde, but on the inland side of these just before the farmland begins we found a few hundred acres of sparsely vegetated dunes, with ponds or richer vegetation in the hollows. Trees sparsely distributed, a few per hectare; they go in some places way up into the dunes. At some places their trunks went $1\frac{1}{2}$ meters from the hole, with beach grass cut off about an inch up. Bark quite pale, surely if these are dark trees like ~~mydalaria~~ and Santa Clara del Amor, they are very conspicuous (and completely exposed). Golosin found pellets with two, hare, and mouse in them. We saw peregrine falcons?, another bigger hawk, snake, lizard, ~~acromyrmex~~ ants working hard in a very sparse vegetation, hare, yellow-crowned blackbirds,

dog tracks, and lots of fox tracks.

Drove home via Maderfaga, Conesa, and Magdalena. Shell soil begins at a point north of Conesa east of Dolores. There are then miles of shell soil and tecas and tala to Magdalena (almost), returned to Punta Indio, but no deer there (by full moonlight) and probably no tecas along the river, but surely inland near the talar.

Sept. 23 at 5 p.m. put 70 museum specials in money.

Clear, warmish.

Sept. 24 Traps at 7:30 had 15 Abodon, 3 Colonyr, and 2 Oryzomyr.

Sept. 25 at 5 p.m. put 70 museum specials and 15 rat traps (cheese) ~~on the~~ near the antofrasta to the Eziza airport.

Sept. 26. Rat traps 9 a.m. with clars: 11 Abodon, 5 Oryz, and 1 sparrow and 1 frog.

Oct. 3 Drove to the hills south of Azuel and set out 2 trap lines (about 70 museum specials and 15 rat traps). The hills seem to be between ⁸⁰⁰~~500~~ and ¹⁵⁰⁰~~1000~~ ft high, occasional pasture on the slopes and scattered wheat fields, but numerous rocky summits and outcrops (granite). My traps all near rocks, considerable bunchgrass in places, burned in others, but lots of rocky burrows etc for Phyllotis. Saw visacha burrows, Reithrodon burrow (4 traps there), lizards on granite boulders, lots of Zonotrichia. also & chirrejos. Found boxes of visacha, armadillo, huron, carnivore.



25 km. S. Azul, Prov. Buenos Aires, Argentina

20% of cat, fox and dog tracks. 3 sp. of frogs singing. Even at the summit of a knob of granite outcrops and boulders, there were springs and pools of water in rock depressions. Knight clear at 8 p.m., cloudy later.

Oct. 4

Sky overcast at 5 a.m., and light rain ^{- began} before 5:30 a.m. Picked up all traps. First line 4 Alouatta and 1 Galea (in museum special). Second line, among good boulders etc, 9 Alouatta, 1 young Peromyscus, and, at the very top of the knob, 1 Opomyza. Stretched back to the main road 7:30 to 9:00 a.m. Struck once. (One Alouatta and 3 spring traps at the Peromyscus hole), also saw about 4 hares and several bats. This camp is on the Azul - Martin Fierro Road.

after skinning drove south on Route 3 from Azul to km 337, which is about 40 km S of Azul by road. Set traps at 2 rocky knolls ^{3 km} east of the road, about 45 museum specials and 10 rat traps (3 p.m.). Good rocks and rich unburned vegetation of bunch grass, herbs, a broken-like fern, even a few small bushes. On the walk to and from trapping saw about 6 hares, 1 owl, 2 armadillos and about 4 coyotes. One of these flew up grade in a cross breeze for 300 yards. Almost caught 1 of the armadillos; had him by the tail but couldn't make him back up. Afternoon sunny.

Then drove back north 6 km and set about 10 ~~traps~~ museum specials near a grazed rocky hilltop. Neither of today's rocks are granite. Shot Galea in late afternoon. Night clear.



Oct. 5 morning cloudy. Line of 10 traps had 10 abodon^{all pale}. Other line in very dense vegetation + rocks had 6 dark abodon, 7 pale abodon, and 4 Opymyterus. In addition, 1 Op was eaten and 7 abodons. Only 3 traps were unsprung. Smelled skunk and saw fox. many guinea pigs along road early in the morning. Stopped to skin nest to on horned nest in construction. Both members of the pair alternate bringing mud; one works on the oven until the other arrives.

Oct. 17 The concoloros seem to stop a little north of Aguil. Left 4 a.m. with Berg, Cullen, and Busch for Bonifacio. Saw two, digging, and caught 165, 5 E Boliv. Occasional digging farther onto Bonifacio but nowhere abundant. at Bonifacio I could only find a couple of fresh diggings in $\frac{1}{2}$ hr and the others found only a few. I set 4 jump traps for tucos and an assortment of traps around a pair of holes I think are Reithrodons, also ~~do~~²⁶ ~~to~~ museum species in a sedge field near Lake Alvar, and 36 Spermomys in lush pampa grass - common along the railroad about 5 km S W of Bonifacio. Evening calm, slightly cloudy, $\frac{2}{3}$ moon.

Oct. 18 Heavy dew. 26 traps north lake caught 2 abodon azarae. Several traps near the Reithrodons hole were sprung, and two others had abodons. The 36 live traps held 1 abodon and 1 tiny Cavia, about 5 tucos in my traps. Heard two singing while I was jacklighting, and heard 2 others during the night and at

down, but none later. as yesterday, very little two activity in the afternoon (and precious little in the morning). ~~There are~~ Some of the tucoas are big and pale like *Necochea* with crested tails and others are much smaller and darker. Some of the excavations are huge.

Dug out a different *Reithrodon* hole and the *Reithrodon* escaped. Dug out the hole ~~the~~ thought he went into and found a half-grown guinea pig.

at one time about noon I counted - estimated 100 *Chiriquos* on the ground, scattered, just "waiting", in a pasture of about 20 acres.

Put out a line of about 25 museum specials between the RR and the road in riped grass and forbs, not the big heads of *Pampa* grass like last night. Also clusters ^{at} 3 *Reithrodon* holes. (plus assorted two traps). We haven't seen a *Cavia* here, although several dead ones and lots of droppings, and at dusk great scurrying in the big grass clumps. The biggest collections of droppings are visible where fire has burned over the big clumps of *Pampa* grass.

Oct. 19

Blustery wind & clouds arrived about 2 a.m. Traps held 2 *Neotomas*, ~~3~~ ³ *Abdoms*, and 2 *Reithrodons* (in museum specials). at noon dug out another *Reithro* burrow in lush green grass, mostly about 8" tall, but around the region of the 3 burrow openings it had been grazed down considerably (diameter of grazing $\pm 1\frac{1}{2}$ meters. The three openings were within 2 meters. all decadal

very steeply (as in most of the others dug out).
Two of the holes were connected (") and at a depth
of 20" was a fine grass nest with adult ♂ and ♀; the
♀ with bloody vaginal opening but no young in the nest.
Saw bare. Fresh greenish grass-filled droppings
near the holes, rather irregular shape, some of them pointed
at one end.

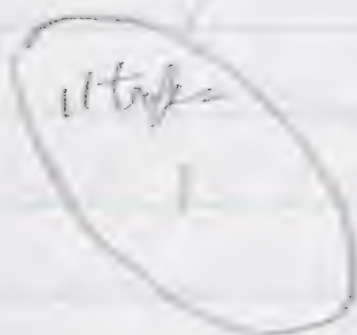
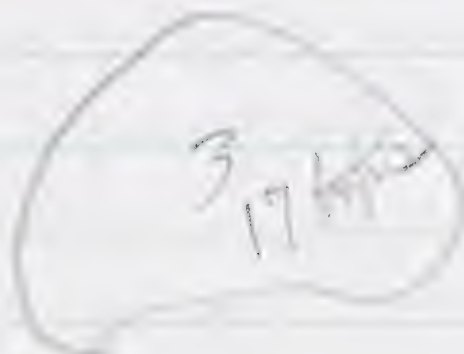
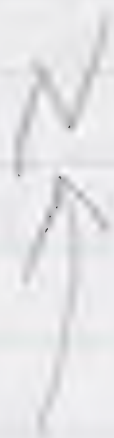
Oct. 25 Set 54 Shermans with rolled rats at Santa
Zara at 6 p.m. Yellow iris in full bloom. Traps in
about same places as in June with King - some
in grass along trail, some in "forest" near edge of
marsh, and some at edge of leery tangle. Very few
signs of mice. Warm, few mosquitoes.

Oct. 26 Traps held 1 big Oryzomys, 3 young Appaycterus
about 25 grams, and 2 adult Oryz. Tore apart
many big clumps of cortadera: all of them with
mouse nests, mostly old ones. One of them had
3 young Oryz about 10 days old. Saw guinea pigs.

Oct. 27 Set 54 Shermans at Ezeiza, 15 of them over
the Police academy and the rest at the usual place.

Oct. 28 Traps held 10 male Abodon (only one at the
Police School) and 1 Oryzomys +

Oct. 29 Left 8:45 a.m. with Golfin, Piantanida, and Lowe
for Vallis del mar. Arrived 3:30, covered the study
area etc., and set about ⁴⁶ 40 Shermans in 3 small cuencas
on the area. Some cortadera clumps and some good
vegetation. Found tracks, numerous pellets etc. Night



midway
Banks

clear for some of the time and cloudy some. no dew.
Saw a tucu at about 6 p.m. digging 15 feet from the
big tent. He ventured as much as 2 feet from his hole,
swelled with his hind feet, etc. some singing by others:
very slow and dull sounding.

Oct-30 The ⁴⁶36 traps caught nothing. Museum specks
set by others in a cortader "marsh" caught nothing.
Set 5 tucu traps 1 km. west where the dunes meet
dark heavy soil. Could find no tucos in the dark
soil, but a few in slightly granitoid soil.
Caught 4. Saw another tucu digging at 7 a.m. near our
tent, behavior as before; color spectacular: rump
black (near), inguinal white, head shoulder and back
brown.

Carol saw a foti and I saw one, both in A.M.
Surveyed area: 180×180 m. Anita put out a handful
of museum specks ^{in PM} and caught 2 Oryzomys before dark.
with a total of ± 30 overnight she caught 2 more abodon.
all afternoon and early evening very windy with a few
sprinkles, wind surely > 30 ~~mi~~ m/p.h. and cold.
Set 53 Sherman in Cueva ^{entrance} abrujida and in the biggest
lusher Cueva in the SE corner.

Oct. 31 1 Calomys in Cueva abrujida (N end) tagged 1559 ad ♂,
1 Oryz. in big Cueva ♂ 1560 ad, and 1 ♀ abodon again
open 1561 in big Cueva.

Natasha and I mapped tucu on the area all morning (36
sets of diggings marked, but only half of them today's. Sunny
and windy. Checked live traps at 4 p.m. and had the

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130-140 at $3\frac{3}{4}$

44:15
26:10
45:30 140

abandon again (1561) 9 meters west. Left traps in same place but didn't reset the 4 that captured.

Set 8 rat traps around piles of old tin cans in a crevice, baited cheese or fat. Night clear + calm. Saw 2 hares in road at dusk. Heard fox bark. Photo of tree trunks 39" from Duran

nov. 1

Heavy dew. Opossum tracks across area, ^{to cut desert grass flush.} plus usual fox. Traps at Cueva Embrujada caught nothing; traps in Cueva grande recaptured abandon and Pyg. and one other adult ♂ abandon tagged 1563. Many mouse tracks across the desert!

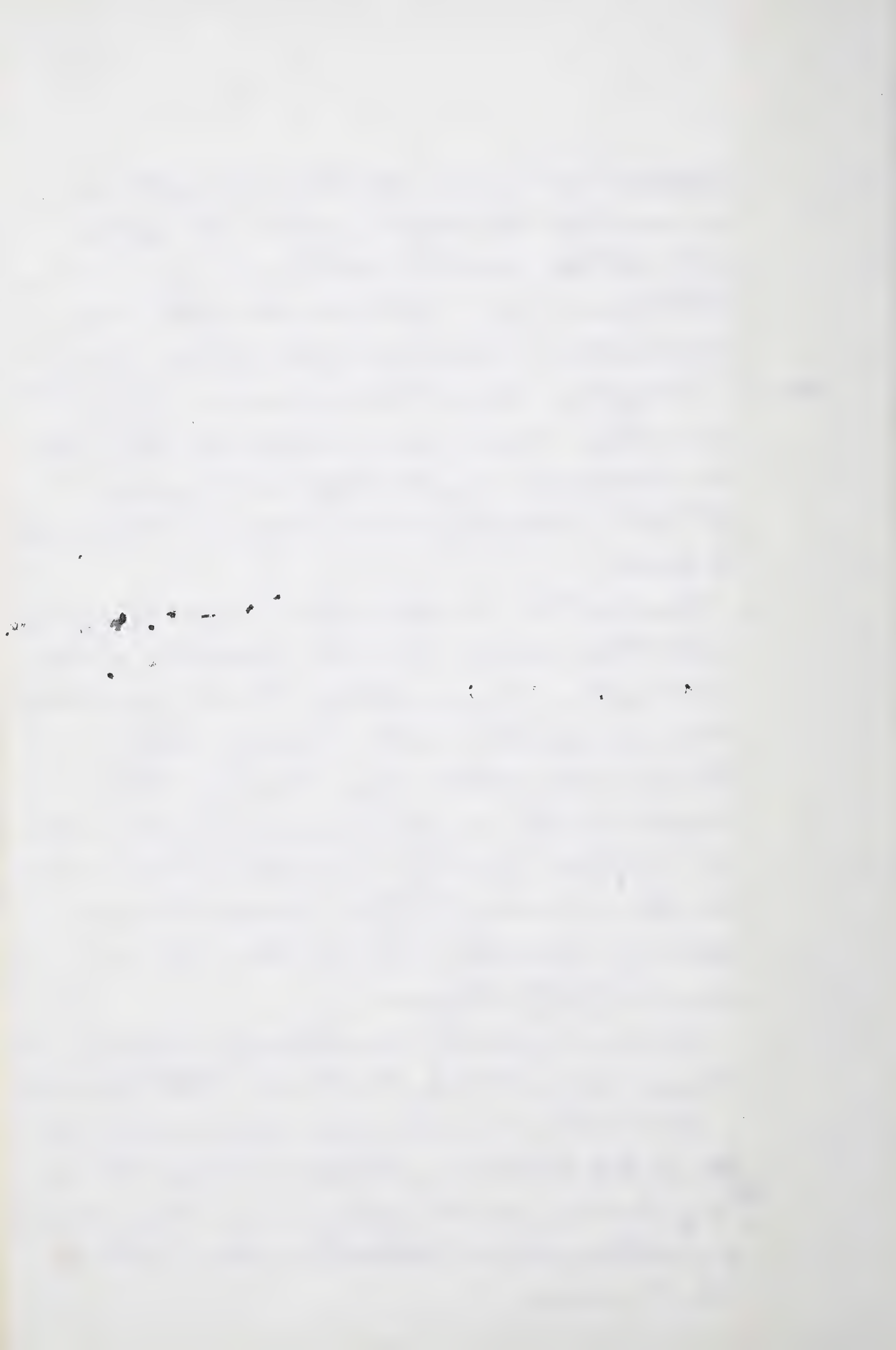
Recounted trees (see note) and found 36 fresh diggings of last night or this morning. Most of them repeats from yesterday, but 13 of them not seen yesterday (but about 13 of yesterday's without fresh sign today). Lots of digging activity in the morning and scattered singing between 9 and 11.

Each tree seems to sing only once for < 1 min, then stops for a long time (10 min.?). Some counts: 44 notes in 15 sec, 26 notes in 10 seconds, 85 notes in 30 sec and this series continued for < 40 seconds. [$\approx 3/\text{sec.}$, $2.6/\text{sec.}$, $2.8/\text{sec.}$].

Singing is definitely contagious.

Two trees 4 yards apart simultaneously (one feeding, one digging), turned out to be ♂ and ♀ when ~~the~~ traps/red dms.

Several of the trees we have seen digging or feeding but ~~then~~ had black rumps, and a male truffel also did also: all the hairs ^{tips} cut off (by biting?, parasites?, fighting?) leaving a fringe of brown around the base of the tail. Looked briefly for bees and ants but didn't see any.



Set 45 Shermans in the desert/proximal part of the study area where I saw numerous tracks this morning, also 8 in the dunes near camp.

Evening clear + calm, jacklighting saw nothing.

Nov 2 Trofs in desert caught 3 Colonyz, including 1559 50 ft south of middle of the plant transect. This is about 150m from his first capture in Cueva Sandy. #1564 was 20 ft. S of edge of Cueva Choa, and 1565 was 40 ft E of SE corner of area.

Two censuses see map. AM of Oct. 31 counting fresh signs plus reasonable cluster of older droppings = 37. AM of 1 Nov.: AM of 1 Nov, clear + calm: 44 fresh, 25 of these repeats (A). AM of 2 Nov. " " : 44 fresh, 29 of these repeats from yesterday and 4 repeats from 31 Oct. and 11 new. See Oct. 3 for summary most of day plant censusing etc.

Nov 3 Set 43 trofs (Sherman) in desert on our side of road and 8 in alamo-swamp, night calmish + clear
Oct. 3 Nothing in traps in desert but in the 8 in alamo-cortado swamp were 1 Oryzomys (escaped), 1 big long-tailed Colonyz, and 2 Akodon azarovi. The 8 rat traps in the cuevas with the rusty tin cans (not checked yesterday) had 1 fresh Oryzomys.

3 moheas set about 7 a.m. caught 2 ♂♂ in 15 minutes and the 3rd spring. One of these was 5 yards from the ♂♀ that were 4 yards apart. Traps set for 2 days in these ♂♀ burrows were not touched, and another for 2 days in the burrow of a lactating ♀ caught nothing. Morning overcast.

1964
Recon

Summary of census on 2 Oct:

X = 31 Oct. all reasonable signs

Δ = 1 non fresh diggings

O = 2 non fresh diggings.

O = 11 Δ = 13 X = 4 Δ X = 16 Σ = 44

From the distribution of triangles + circles on the map, it is almost certain that in addition to the 44 circles there are 14 different triangles = $44 + 14 = 58$. add 5 for probable ones missed = (63). When in doubt, fresh diggings more than 5 meters apart were considered to be separate animals. I think the 63 is a minimum estimate. = 20/hac.

28 g. fresh of rhizomes of dense grass weighed $11\frac{1}{2}$ g air-dried.

Nov. 6

To Punta Lara in PM with Kibbiky and Carol.

Set 50 Shermana baited with rolled oats, mostly at edge of a large Cortaderia marsh among the Cortaderas, but some in forest, iris grove, etc. Clear, calm.

Nov. 7.

at 7 a.m. traps held 5 Oryzomys, 3 Akodon agouti, 1 Akodon humbi, ~~1~~ 1 Oryzomys flavescens, and 1 O. delticola, saw numerous guinea pigs.

Between 50 and 100 Coracaleros between the river and Villa Eliza.

Nov. 9

at 6 p.m. put 50 Shermana at the same old place on the autopista to the airport ("Eziza").

Sunny, moderate temp.

Nov. 10.

at 9 a.m. traps held 10 Akodon, 1 small Oryzomys and 1 large Oryzomys

Nov. 11

To Magdalena with Contreras, Card & others. Camped at the cow pasture + talas 24 km. SE of Magdalena at 9 a.m. Set about 7 wascoches and ran them many hours or so and caught 18 tucos during the day. Sunny, light breeze. wascoches with testes about 10 mm look passed, almost all ♀♀ lactating and early preg. The testes don't look healthy. almost all with 3 testes. Definitely 2 kinds of soil here: dark with shells, quite heavy and hard digging in places, and a much lighter very sandy brown soil. guirapato sets in between the two in a soil somewhat intermediate but mostly sandy (and with shells). The only ♀ caught N of the fence had 6 testes instead of 3. Talas N of fence. Sleep, camp, and horses in the pasture.

Nov. 12

a.m. cloudy. Trapped for live tucos, caught 6 in about 1 hr with ± 12 steel traps. Started home about 11 a.m.

Nov. 25

39 Shearwaters in ruices at 6 p.m., same live as on several previous occasions. Lots of sweet clover in bloom, thistles, etc. Weather sunny.

Nov. 26

at 6:30 a.m. 3 abodon, 2 Oryzomys (one tiny) + Colaptes. Weather sunny

Dec. 7

Set 100 mouse traps baited with corn meal along antofrutas toward airport, almost all of them a little further toward city than former trap lines. (Tot. 7 p.m.)

Dec. 8

at 8 a.m., warm, traps held 17 abodon and 4 Oryzomys (one of these very small). Many traps sprung (guirapato) and about 8 Rana-looking frogs.

21

21

Dec. 18¹⁹

To Valeria del mar with Gallopier, Bush, Montanica, and family, 8:30 - 3:15. Rain on way. Set 50 museum specials at 6 p.m. east of study area, all in desert habitat, corn meal bait. Windy + cool, 1 night part full moon.

Dec. 19²⁰

Nothing in traps. Day coolish, scattered clouds, fairly windy. Counted tree droppings 8 a.m. apparently not much activity. Trouble placing them on Martha's map, so, after laying out a 120 x 120 m. grid with stakes, Martha and I re-drew the SE part of the map.

at 4:30 put 45 Shermans on the grid (except G 7, 6, 5, 4. Aunts a bit of two singing about 6:30 p.m. aunts but about 25 museum specials. night partly cloudy. Caught a young ($35 \pm g$) ^{tree} ~~two~~ in a big Sherman.

Dec. 20²¹

morning clear, Dew. Ran traps at 5:15 - nothing in mine or aunts. Caught young tree in a big Sherman baited with oatmeal + Found a tree burrow with tracks 64 inches out into sand. Covered trees on area with Martha at 7:30 a.m.

The hole where the baby tree came from remained open all day, but was closed later in the afternoon. Set another trap there. Caught another baby tree about the same size in a big Sherman about 50 yds away. This one has a dark "ivory" rump like some of the adults. yesterday, heard a tree calling, set a trap at the hole, and within 2 hrs. had caught a ♂ 150 g.

Reset the grid traps at 5 p.m. (except G 1, 2).

Dec. 22 morning windy, warmer, drizzly. In the grid traps one Colonyz adult at G 4 or 5. Escaped without banding. Very little tree activity all day.

Anita had 40 museum specimens in alamar and Cortaderia clumps - no swampy ground now. Caught 1 Alodon with 2 large warblers, 1 young Colonyz, 1 monodelphis (40 spec.), 2 adults Apyngsten, 1 grey juvenile Apyng. One of the adults looking and early pregnant.

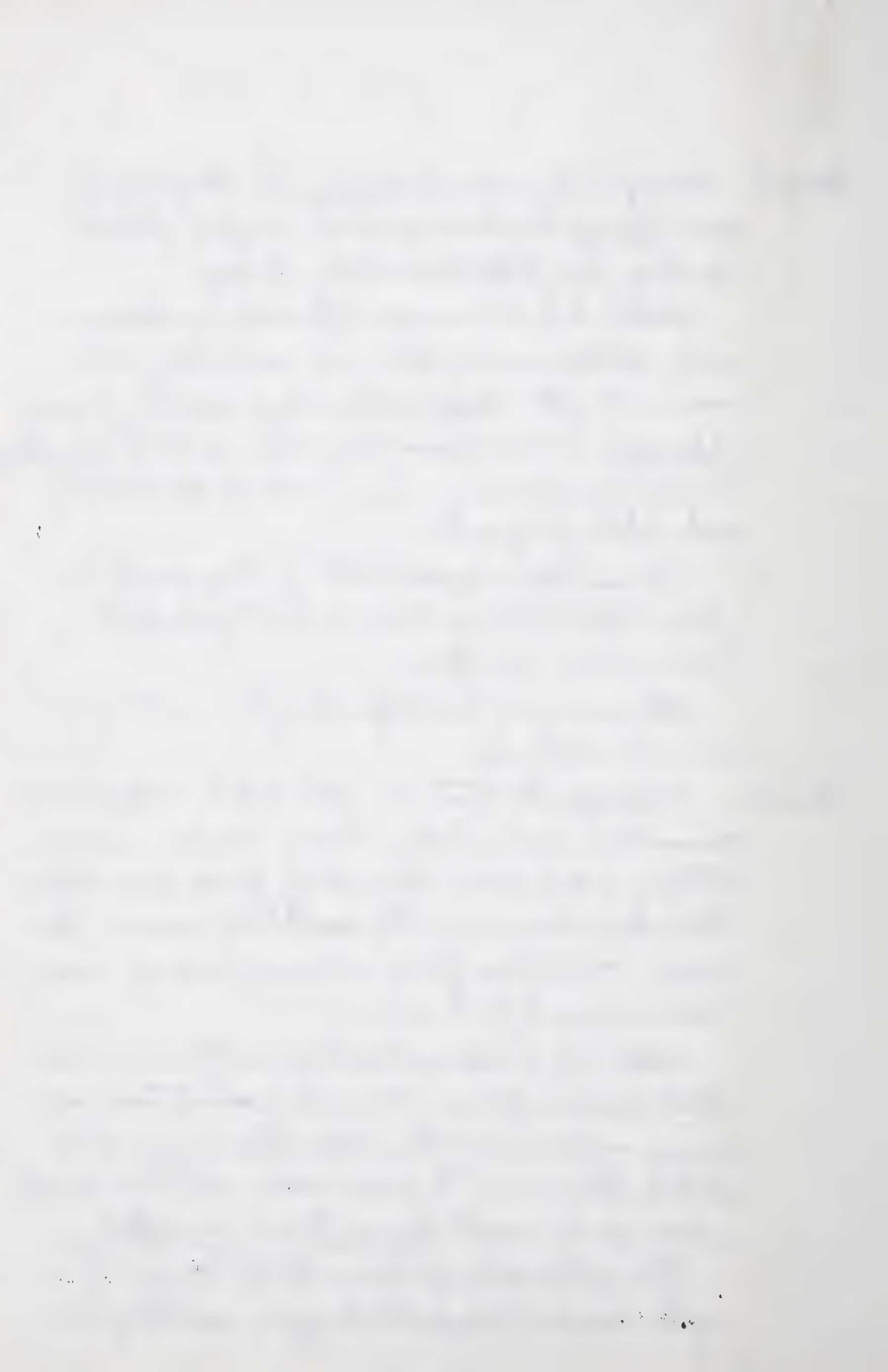
Excavated a square meter of "tree desert" in P.M. water table in Cuenca Embryoda about 10 cm below surface.

Set some grid live traps at 5 p.m. Every overcast, with wind.

Dec. 23 1 Colonyz (longtail) in grid at E 7. marked 1575. no more trees in live traps. morning was clear and calm between 5 & 6 a.m., then cloudy for an hour or two, then clear again, with ~~west~~ wind, warmer than before. many dragon flies and many burrowing larval. trees singing at 5:30 a.m.

Walter and I made another tree count in a.m., and plant census in p.m.. also marked ~~whole~~ trees were singing in p.m. (on male). Hot & little breeze. Anita set 38 Skermans in the grass - wide - Cortaderia clumps where she had caught Apyngsten & monodelphis.

The stature baby tree does a lot of "crying" at night. Sounds like repeated buzzer, something like



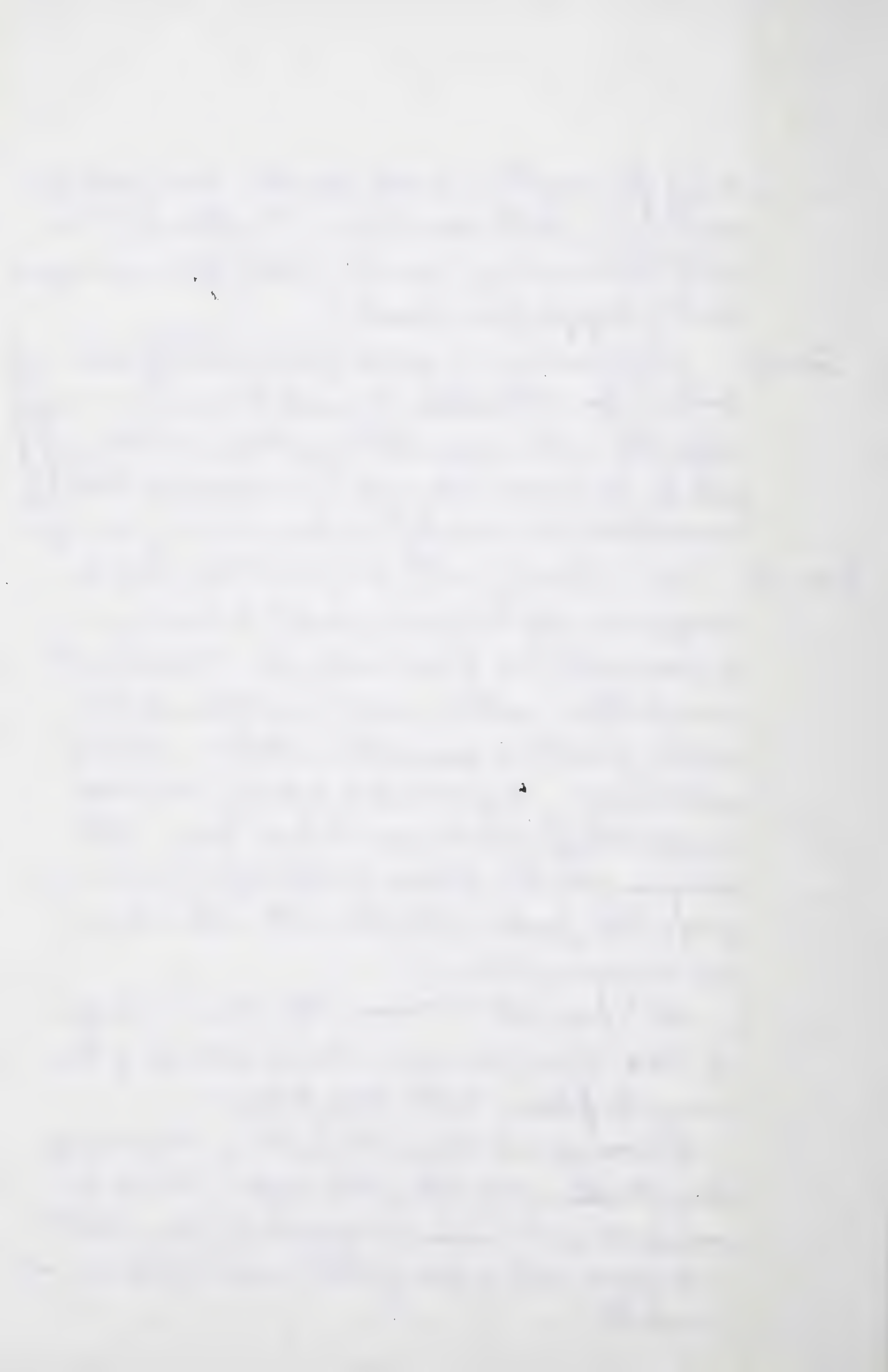
a big fly caught in a spider web, much scratching on his can at the same time. The other lady tree, about twice as heavy, doesn't call like this nor respond. about 2 buzzes per second.

Dec 24 Night warm and much of it completely calm. ant's traps untouched. Censused trees in a.m.; apparently much more activity yesterday and today, perhaps because of less wind. ± 15 new ones today. Huron? traps on area. Left for home 11 a.m., back 7 p.m.

Dec. 26 Left 5:30 a.m. with Card, Contreras, et al for Magdalena. arrived 10 a.m. and set 7 wasps in a weed field ^{NW} west of our usual field. This field with many thistles, assorted grasses, mustard, and other weeds. Probably 2 years post-cultivation. Riddled with bees. Caught 11 before 4 p.m. (woodcock occupied traps). Bright sun and brisk breeze. Little singing until late afternoon. males past prime, no prog or bet. females (Julia had one with small embryos), no very young ones.

at 7 p.m. set 31 museum specials in clumps of tall trees - numerous clearing islands of them among the fields. Night clear, breeze.

Burrowing owl seems to hunt by hovering for long periods, very high, then drops. Found an occupied owl burrow surrounded by two rostra and young and a few pellets including bones and insects.



Dec. 27

morning clear & calm. T weas began calling at daybreak during first bird song. almost always I find an open hole when I localize song. Usually not a fresh excavation.

Dec 28

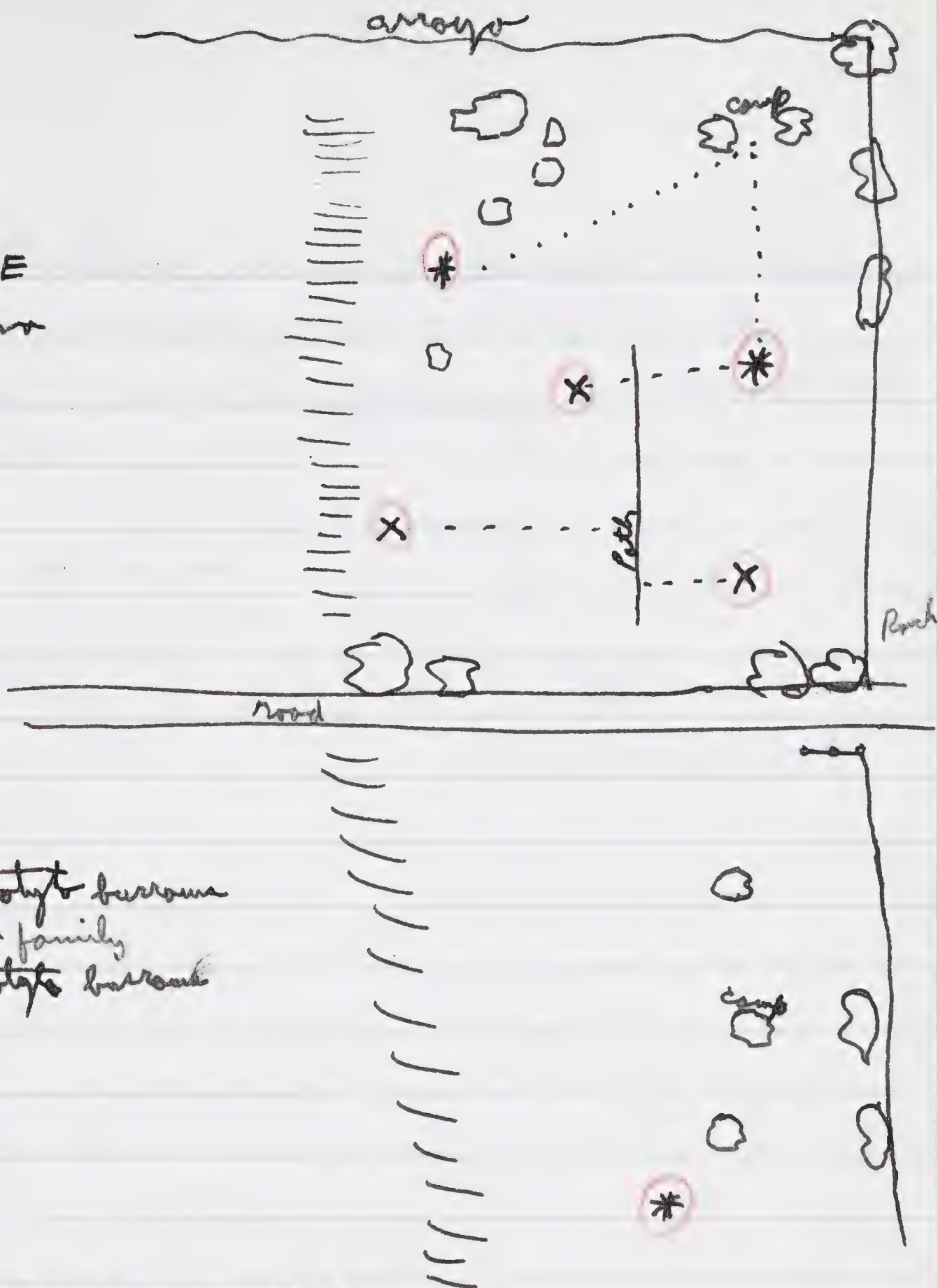
nothing in traps. moved up to the "old" trapping field, which is still green grass, almost turf, with only a few thistles. still bear clover seeds on the ground. Set 10 snares and caught 8 weas before 10 a.m. Total for Julia + me 53.

another burrow of owls in this field: two ~~flew~~ off when ~~approached~~ they made a series of shrill cries sort of like Texas or shore birds to distract; and the 3 remaining marched down the burrow. They repeated this performance later (twice).

Carol found ~~two~~⁴ more burrows; at one of these all 4 birds flew off. These observations of "faints" running were about 8 a.m., warm and sunny. all ⁶ burrows had two boxes scattered around, and a few pellets. Carol found other pellets under tall thistle plants.

1964
Pearson

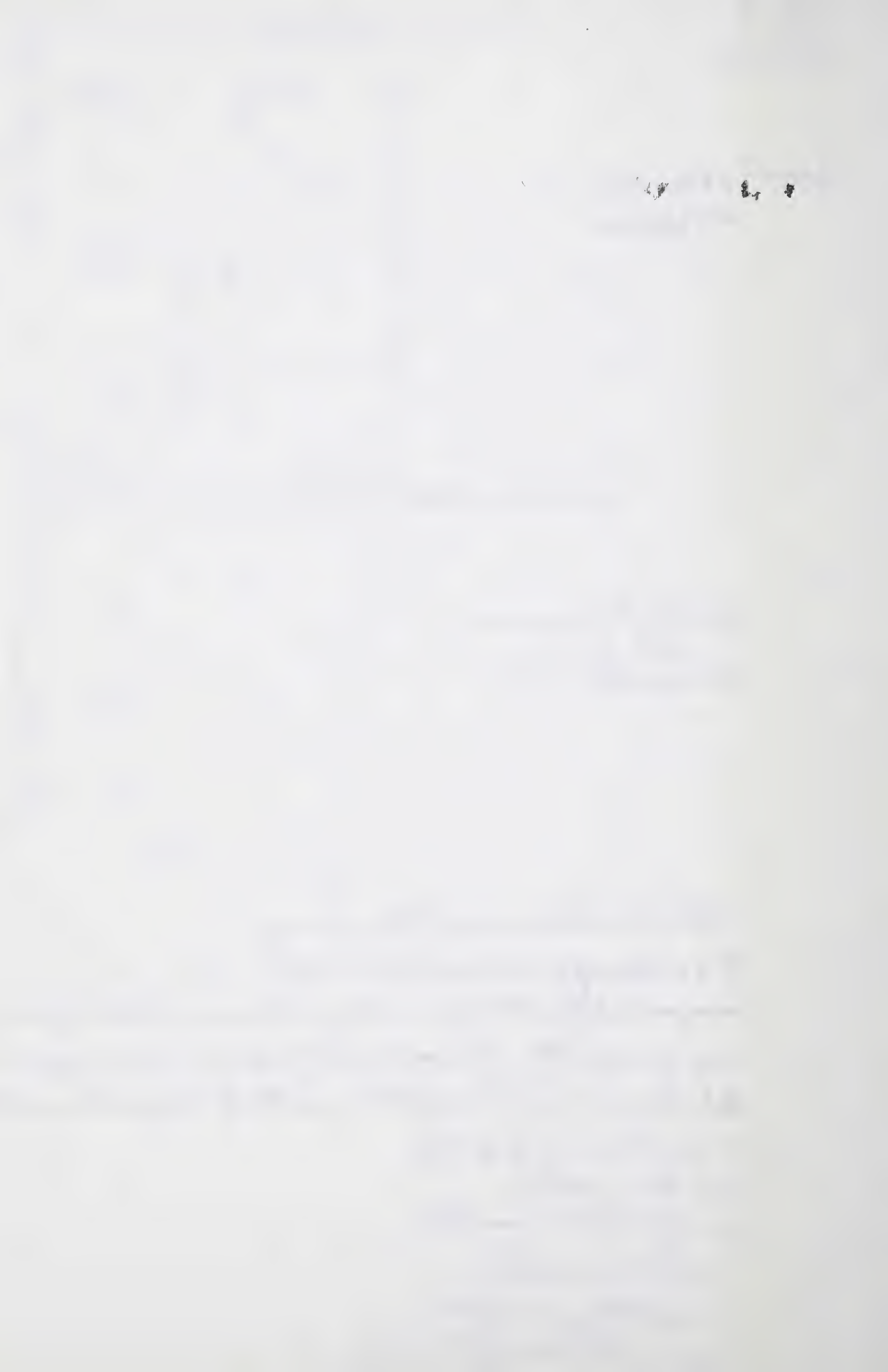
Dec 27 24 km SE
mugdale



* = Speotyto burrows
with family
X = Speotyto burrows
without family

material collected around these burrows:

- ± 8 droppings of seeds & fruits (abundant?)
- many owl pellets with fur and with insect remains (beetle elytra etc)
- many owl pellets with ~~two~~ bones, bones of 2 to 5 frogs, and
(abundant) birds, and 1 mouse. One pellet consisted of sheep wool & insects.
- 2 small unincubated toads
- 24 taco rostra
- 21 joined two mandibles
- 7 left two mandibles
- 6 right two mandibles
- many of the tucan girls young



Dec. 31 weather Pianteida, who was recorder on the two censuses, has given me the following summary and key to the map:

Día	march	abierta	muera	(Válida del map)
Dec. 20	□	24		
21	0	35	13	
22	no census			
23	Δ	47	17	
24	X	58	20	"total 74"

why not 78 or more?



1965

Tilcara, Jujuy, Argentina

Jan 28

Put 20 Shermans along the walls near the cemetery, and 2 big Shermans, all baited with rolled oats. Vegetation Schinus molle and big opuntias. 4 p.m. ~~Jan 29~~ also, with 2 chess, just before dark put 4 small Shermans and 6 rat traps among the tumbled stone ruins and cactus and sagevines of the Pucara (ruins).

Jan. 29.

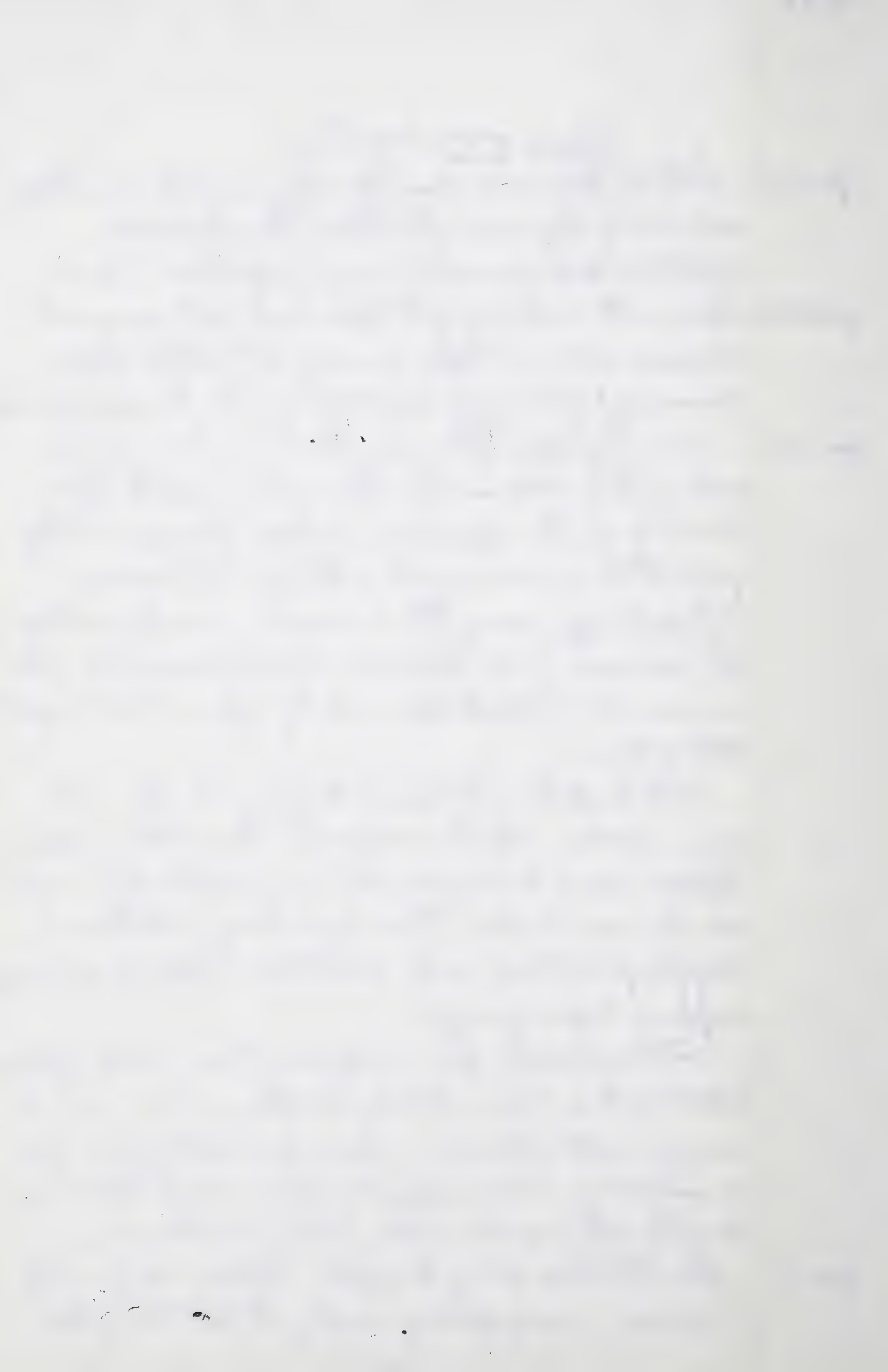
One Phyllotis ^(T-50) ~~and~~ among the ruins at 6:30 a.m. and nothing ~~else~~ in the stone walls near the type locality of Ph. coprinus. 20 large Shermans set by Julia at the ruins caught nothing, but we saw Octodontomys among the ruins and near the cemetery. Set numerous large Shermans near the cemetery where we saw 2 Octodontomys and by 1 p.m. had caught both of them.

Walked up the hill behind the town to the rock sign and then into the canyon to the north: Tilia, Ephedra, some bunch grass, and an assortment of small shrubs and herbs. Found one large collection of droppings containing only crustaceans and Buprestids, dropping large dog size.

Another Octodontomys (= 3) at same place in the afternoon. Put out about 30 museum specials and 5 Shermans in a Tilia canyon north of the Buenavista sign about 4 p.m. and a mixture of museum specials, large + small Shermans along the walls near the cemetery, baited with whole corn.

Jan. 30

Sprinkled twice during the night. Traps in canyon held 1 marmosa, many sprung + empty, at least two of them



by Octodontomys. The traps along the walls held only one toad.

at 10 all 15 walked or rode up to the end of the road at the gorge, then all hiked up to a ridge above Alforato at 2900 m. Vegetation still about same as in Tilcara. Petaconus gigas sitting on nest in a willow tree 15 ft. up at Alforato.

Just before dark put 35 museum specials along a stone wall along the river (west bank) about 2 km north of the bridge. Vegetation: Cortaderia clumps, weeds, a few willows. Rig set some rat traps and some shermans.

Jan. 31

Rain during night. my traps held 1 mouse, numerous sprung empty. Rig had 3 andinomys in rat traps.

Various explorations during the day, and then at 7-8 pm set 35 museum specials with corn along stone wall in an outwash between the town and the Lucara. ~~also~~ also about 20 shermans large & small and rat traps. Some opuntia, carden, small willows, a few bushes and herbs, and 2 patches of corn. not much mouse sign.

Feb. 1

Ran traps 7 a.m. ⁵ Phyllotis, some of them at least Ph. caprimus. Except for the bushy willows, habitat not really brushy. Rig with assorted large shermans and rat traps caught nothing.

~~Feb. 2~~

In afternoon drove to Leon and set museum specials and rat traps in various brushy and weedy habitats. also 12 museum specials near marsh near Tumbaya.

Feb. 2 2 abodons in my traps near Leon. Reig had one young Cavia in cotails at Tumbaga.

I've set large + small Shermans ^{± 3.0} in stone walls near cemetery ~~at~~ Tidesa. Numerous cuttings of weeds and alfalfa? Rain in P.M.

Feb. 3 2 Andinomyia and 1 Phyllotis capensis and 1 mus in my traps. Ants ran them during the day and got another Phyllotis.

Left 9:30 with Reig + others for Abrufamper. Saw first two burrows 15 km S of Tres Cruces amid Lepidophyllum bushes on sandy soil. Set traps here. Then drove on to 8 km N (by road) of Tres Cruces and set more traps there (sandy soil with Lepidophyllum and other bushes). Weather hot, little wind. Traps set from 1 to 5 at first place, 3 to 4:30 at second place. Caught about 12 large rob tuas, no singing, and not much fresh digging; mostly plugged feeding holes. A pair of burrowing owls at 8 km N had been feeding on very small mice, insects, 1 frog, 1 tucu.

Feb. 4 Whole family down with fever (40°), diarrhea, nausea, headache, and unnumbered aches + pains. With Christian set about 20 small Shermans and 8 big Shermans hoping to get Octodontomys and Phyllotis darmian (just before dark) in the Pucara.

Feb 5 nothing in traps. Saw 2 Octodontomys while running traps.

Just before dark set 15 small Shermans and 4 large Shermans, with Christian + Sandy, at

the "Bienvenidas a Tícará" letters on the hillside above the town, Vegetation quite sparse, ground with scattered stones too small for mouse shelter, but the letters are made of piles of large stones & slabs and look like effective shelter for mice.

Feb. 6 at dawn had 4 Phyllotis at the letters, 2 of them in the only 2 large Spermomys that set.

Feb. 7 Started for house with 2 lists from Tree Creek, 1 Arvicomys, 2 Oryzomys, 4 Phyllotis from Tícará valley (capensis) and 4 from the letters on the hill (darwini?)

Feb. 14 Put 15 Spermomys and 105 museum specimens in 3 places on the antofrista short of the airport (one of the places same as before, part of which had been buried) (7 p.m.)

Feb. 15 at 7 a.m. traps had 43 Abodon and 5 Oryzomys. Only 5 of the Abodon from the old place.

Valeria del mar

Feb. 23 arrived after dark at Solórzano's study area with Solórzano, Busch, & Piantundo. Surface of sand much cooler than below.

Feb. 24 a.m. cloudy, warmish, no wind, mostly sunny in afternoon. Area has much more vegetation on it than before; Solodope is now especially prominent and in

Bloom; the cordillera or also with fresh showy
plumes. The sweet clover is mostly passed, but some
still in bloom and the Texas cutting lots of it, even
stalks as thick as pencil and drying up. Set 4
incubated at about 8 a.m. and by 11 had ^{two} 2 and one
more in afternoon, not breeding a in spite of a recent
rain the cuencas are drier now - no standing
water on the area. Lots of huge parasite wasps
digging holes in the mud and stuffing house? flies
down them. In a.m. helped sample vegetation
and dissected Texas. In p.m. there appeared
to be more Texas activity, so Martha and I did
a count of fresh burrows. Only about 35, but
surely lots more Texas present. They were so busy
and digging right up until dark but stopped then.

Of their three overt activities: singing, excavating,
and feeding, they never do more than one at
any one time. An excavating two never stops
to eat, etc. The singers never emerge, but
I think they sing from open burrows.

Found 2 burrowing owl burrows on opposite
sides of a steep dune, and 2 owls in attendance,
but no good pellets nearby. A Capsimulgoid
few over the area at dusk, and a flock of
spur-winged geese landed for a time
just off of the area.

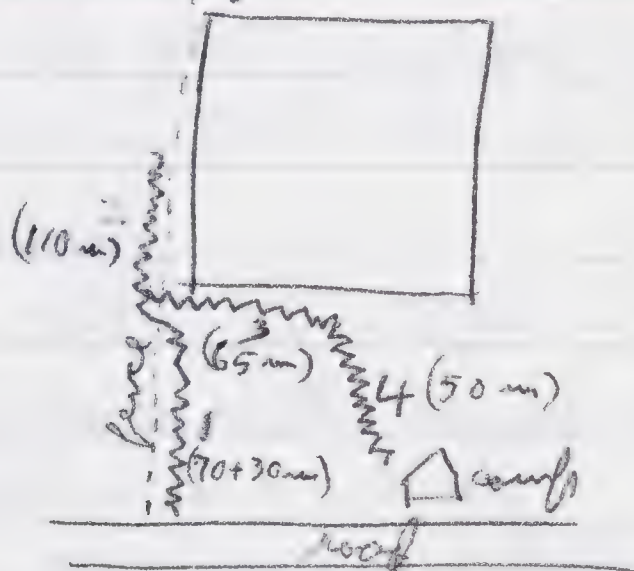
1965
Pearson

Valeria del mar

Feb. 25

night warm & clear, no wind, with mosquitoes.
Spur-winged geese feeding in Ciénega Estrella on sweet
clover. Censuses of trees in a.m. with weather; warm
& sunny, many more fresh droppings than yesterday.
In p.m. dug $\frac{1}{2}$ -meter square plant censuses in the
desert. There were lots of tracks in the sand in the
a.m. including hare, fox chasing hare, and mice wandering
long distances in the most deserty parts.

at dusk made a drag of pine boughs and dragged
a trail from the ~~E~~ road along the west fence to about
the level of Cerro Tuz, then another one from the west
fence along the south boundary of the area to the
middle, then along the path to camp.



Feb 26

at 6:30 (partly cloudy, windy) the sweep paths were as
follows:

- ④ (50 m) mouse, fox, insect, insect, ~~fox~~ ^{hare} mouse ^{mouse} ^{toad}.
- ③ (65 m) mouse?, [hare (wings & drags) hare], hare
- ② 110 m (partly windswept) hare, fox, bird, hare, fox, fox
- ① ~~bird~~ 70 m ok and 30 m through Ciénega⁺. (Hare went down middle) Bird,
bird, fox, bird, fox.

24 km SE Magdalena, Buenos Aires Prov., Argentina

March 18

Left 6:15 a.m., with class. Set up grids at east end of the grazed pasture (sheep, cows, horses) beginning 10 a.m., scattered clouds and brisk breeze. at about 1:30 started counting fresh burrows. Not much singing at this time but later in afternoon when wind died down there was much singing. Tried localizing some on grid. Song lasts about 15 seconds and includes 30 to 75 notes, more rapid towards end. Evening clear, calm, moon over night part full. Texas song (lots) until after 9 o'clock. Many would sing for a time, then quiet, then more singing, almost no singing in the morning.

	20m	20
20	Pegosa	Praetoria
20	Briston	Boing
20	Bush	Dalphin
20	Delore	

While localizing the sounds, certain individuals appear to have sung 3 or even 4 times in the \pm 2-hour period (but never twice in succession)

March 19

morning clear, windy. Set 24 live traps in the dark soil, ^{about 7:30} then worked burrows on the census area 8:30-9:30. Ran traps at 11 a.m. = 11 traps.

after lunch hunted for *Sphyrapicus* burrows + pellets. The one in our pasture that had parents and young Dec. 27 is now abandoned and covered with grass. There is another one close to the ranch house. It had a bird near it March 14, ~~and~~ when we arrived here yesterday, and early this morning, but this p.m. it was dead and no bird; but a few pellets. The field with the others (see map for Dec. 27) has been plowed and

is coming up to unearth? a few inches high. Several ~~spectator~~ sitting around but found no good burrows (although several looked like they had been started and were $1\frac{1}{2}$ to 2 feet deep). Lots of ~~was~~ ant in the plowed field. Found one good

burrow at the very edge of this cultivated field a little beyond where Tucis was trapping tucos. There were 5 or 6 spectator sitting near this burrow (2 squabbling).

also another burrow on the barranca about 150 m beyond the end of the tongue of talas that extends west from the road

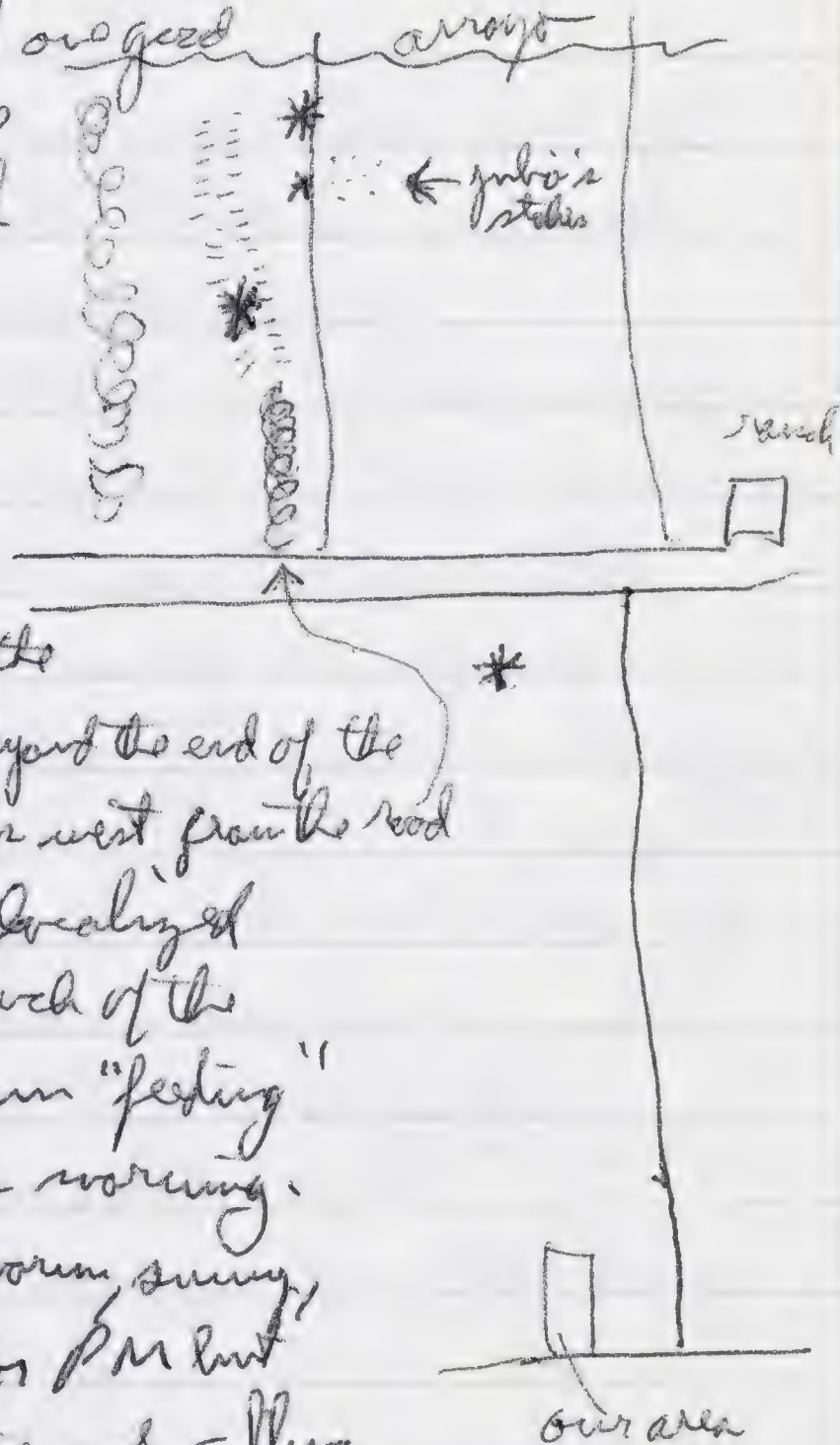
Went to town, then localized tucos calls from 5 to 6, much of the calling seems to come from "feeding" holes opened since this morning.

March 20

night clear, morning warm, sunny, little wind. Some clouds in PM but warm + calm. Tucos active and calling all day but stopped at dusk 6 p.m. Still calm.

Set 4 more moletraps in black soil for 3 boxes and caught 3 tucos. Also 2 steel traps during most of day caught 3 lizards and 1 dead tucos.

Census of tucos (fresh holes) beginning at 7:30 a.m., then trapping with 6 moletraps in each of the 8



20+20 "exterius". By 6:30 p.m. I had caught 8 on my area, probably a few left but no definite sites. Others caught 5, 6, or 7. I caught a ♂ and a ♀ only 61 cm. apart. All of the "singers" noted so far have been males.

March 21

Caught 2 tuas on my area between dusk and 8 p.m. Some singing after the moon came up. I think moonlight encourages singing.

Checked two traps at 5:30 a.m. nothing on my area, but one trap was buried. Set traps in numerous old burrows and several near the buried traps, but no further evidence of animals on my area.

Walked back to the Speotyto burrows. Goloffin's is 170 m. beyond the last tree (2 ovals, no pellets). 6 ovals at the other, beyond Contreras' stakes but no more pellets. Found another burrow with a few pellets at the edge of the plowed field in Julio's area. Total 68 gms pellets (dry wt.).

Morning was partly sunny, warm, light breeze. Checked all traps at 1:30 p.m.

April 14

Put 110 museum specials at 3 p.m. across the road from the original Eyaiza trapping place. Sunny and warm. No droppings or runways.

April 15

At 9 AM traps held 45 abodon and 10 Oryzomys. None of the abodons with green vegetation in gut, none older than age 4, only 3 breeding males and one preg ♀ and 4 parous ♀. This locality on the autopista to the aeropuerto de Eyaiza is 23 km SW of the center of Buenos Aires.

Pearson
1965

24 km SE Magdalena

April
~~24~~ 24

Arrived Magdalena about 9:30 last night; partly overcast, calm. 2 hares on or near our area, plus horses & cows. Sheep in the wheat field.

Inspection of area at 6 a.m. revealed very few fresh burrows; no big mounds of dirt such as are found in the surrounding area. Everybody's "signs" seem to be mostly closed feeding holes (solidas) and a few open feeding holes. No calling on the area, but moderate amount of working. Half of us set traps about 7 a.m. and the other half arrived 10 a.m. and set traps then. Caught about 20 hares on the area during the day plus 5 or 6 hares over, not counting two that we released on a back down occupied holes (with big earth mounds). Both promptly slipped their leashes and disappeared down the hole. no noises. One of these, a female I think, reappeared about 2 hours later and started to move across the top of the ground where she was caught. One of the students saw her emerge.

The vegetation is mixed green and consists of Bermuda grass, Cenchrus pauciflorus, bush clover (Trifolium de carretilla) (Medicago hispida? or minima prob minima), dichondra, a few scattered shrubs, and no doubt some other grasses.

Covering Stercoris. The old burrow in our pasture that contained a pink in December (was?) and was abandoned and closed in March is now open again with one owl in attendance; a few pellets and inside the burrow a partly eaten fresh frog Leptodactylus.

acellatus. at Sig's 170-yard hole were a pair of
owls and a few pellets. Saw two other owls near John's
stake but no burrow. In the middle of the wheat
field are found 3 good burrows, with pellets and
5 and 3 owls, = a total of 13 owls. 160 g pellets (dry).

Our pasture and the wheat field are each 1 km
long.

at dusk set 4 steel traps in 2 arrays under
the road for Lutreolina for being.

night deer for first half, then overcast. Continued
trapping for trees. Total of 25 ~~to~~ when we left at
1 pm. (plus 7 live ones and 6 others dead in live traps).

3 Lutreolinas alive in the 4 steel traps.

yesterday saw 11 Caranchoes circling nearby and sitting
in a treetop.

may 24

with Pablo ^{+ coral} Pantanosely to Wagdalena. Set 5
woodchuck 2 km N. Wagdalena about 10:30 a.m., at
about 8 20.5 km. SE Wagdalena, and about 15
in the usual pasture 24 km. SE Wagdalena. Sunning
and warms. The study area had several fresh
holes, where we set traps - about 10 traps on the area
beginning 11:15 a.m. Lots of singing, including one over
middle of the study area. Run traps about every
half hour.

From our area (edge) to the first swale negro
levee is 100 m, and 100 m. more to the next swale
negro levee.

Pearson
1965

The ~~specter~~ burrow in our pasture was open but no owls and no new pellets there. In the wheat field (green, grazed, sheep present), found two open burrows and a small quantity of pellets. Schupin's burrow (170 m) had a few pellets. Altogether we saw about 6 owls in this field, none in our pasture.

Saw a gray striped cat twice out among the trees in our pasture.

On our study area up to 4 p.m. we caught 3 adult males, 2 young males, 1 young ♀ (80g), and 2 pregnant females. Nearby 5 ♂♂ and 1 nullip. ♀.

2 km N Magdalena = 1 ad ♂ and 1 parous ♀ not preg.
20.5 km SE " = 1 ad ♂ and 1 parous ♀ not preg.

Pearson, O. P.

1968

catalogue #4573-4634

Journal

Peru

Pearson
1968

Catalog

Chillon Valley (2 mi. SW Quives), 4000 ft., Dept. of Lima

June 30

4573 ♀ *Phyllotis amicus* or *darwini*

188 x 105 x 23 x 23 13 g. ^{no emb.}

⁴
2 km NE Pachacamac, 300 ft., Dept. of Lima

July 3

~~chromosome~~

4574 ♀ *Phyllotis amicus*?

[175] x [72] x 23 x 25 31 g. ^{5 emb.}

~~chromosome~~

4575 ♂ *Ph. amicus*?

188 x [98] x 23 x 22 18 g. ^{T6, SV6}

3 km E Hurray, 1400 ft., (Pisco Valley), Dept. of Ica, Peru

July 6

4576

~~chromosome~~

4576 ♀ *Ph. darwini*

221 x 121 x 21 x 27 25 g. ^{no emb.}

~~chromosome~~

4577 ♂ " "

247 x 138 x 26 x 28 36 g. ^{test 5 dark.}

~~chromosome~~

4578 ♀ *Phyllotis rogister*

July 7

2 km E Ticsapa, 8000 ft., (Pisco Valley), Dept. of Huanavelica

^{sniff trap - narrow culture}

258 x 138 x 29 x 26 47 g. ^{no emb.}

~~chromosome~~

4579 ♂ " "

^{sniff trap - narrow culture}

285 x 150 x 30 x 28 61 g. ^{testis dark, 6 mm}

~~chromosome~~

4580 ♀ *Ph. darwini*

[188] x [84] x 25 x 27 29 g. ^{no emb.}

~~chromosome~~

4581 ♀ *Ph. sp.*

205 x 109 x 23 x 22 21 g. ^{no emb.}

~~chromosome~~

4582 ♀ *Ph. darwini*

212 x 115 x 25 x 27 22 g. ^{no emb.}

~~chromosome~~

4583 ♀ *marmosa*

^{Cought at 9:15 P.M.}

216 x 107 x 14 x 23 23 g.

July 8

4584 ♂

Phyllotis

^{head eaten by marmosa}

220 x 125 x 27 x — > 32 g. ^{testis 4 1/2}

4585 ♂

Phyllotis amicus?

156 x 84 x 22 x 21 13.5 g. ^{testis 2 1/2 dark}

~~chromosome~~

4586 ♂

"

203 x 110 x 23 1/2 x 22 19 g. ^{testis 3}

~~chromosome~~

4587 ♂

"

205 x 117 x 23 1/2 x 22 19 g. ^{testis 3, dark.}

~~chromosome~~

4588

"

[222] x [99] x 26 x 29 50 g. ^{testis 8 fleshy}

2 km E Tlacafra 8,000 ft, Dept. of Huancavelica
July 9

4589	♂	<i>Phyllotis darwini</i>	(211 x 95) x 26 x 28	48g	T11 dark, SV18 stomach green
4590	♂	" "	228 x 124 x 26 x 25	35g.	T6 mm white
4591	♀	" "	200 x 116 x 26 x 24½	23g	
chromosome 4592	♀	" "	257 x 141 x 26 x 28	42g.	3 emb.
chromosome 4593	♀	" "	172 x 89 x 21 x 21	16½g	no emb.
4594	"	<i>amensis</i>	193 x 108 x 22 x 25	18g.	
4595	♀	" "	197 x 109 x 24 x 24	19½g.	no emb.

10 km SSE Pisco, 200 ft. Dept. of Ica.
July 11
cay. by day and by night

4596	♀	<i>Phyllotis darwini</i>	228 x 125 x 26 x 27	32g.	saline teeth
4597	♂	" "	— x 90 x 23 x 24	4mm	

10 mi E Arequipa, 10,600 ft, Dept. of Arequipa
July 14

4598	♂ ♀	<i>akodon</i>	146 x 66 x 21 x 14	17g	no emb. SV5
4599	♂	<i>Phyllotis darwini</i>	206 x 110 x 26 x 25	36g	T9 dark
chromosome 4600	♂	" "	242 x 121 x 25 x 26	50g.	T10 SV17
chromosome 4601	♂	" "	241 x 123 x 26 x 25	49g.	T10 SV18
chromosome 4602	♀	" "	203 x 105 x 25 x 23	25g.	3 emb. emb. left
chromosome 4603	♀	" "	188 x 94 x 24 x 22	23g.	no emb.

Rio Huancayo, 13,100 ft., Dept. of Puno
July 16 17

chromosome 4604	♂	<i>akodon bolivi</i>	173 x 69 x 22 x 14	25g.	SV small
chromosome 4605	♀	" "	135 x 55 x 21½ x 12	14g.	
chromosome 4606	♂	<i>Calomys chilla</i>	— x — x 17 x 17	13g	T5½ SV10

July 18
Huancayo

4607	♂	<i>Ph. azia</i>	198 x 105 x 26 x 21	23g.	T3 SV10
4608	♀	<i>akodon bolivi</i>	181 x 83 x 24 x 19	25g.	no emb.

July 19

4609	?	<i>Zonotrichia capensis</i>		23g.	gonads not visible
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4610 ♂ *Calomys ducilla*
SKEL ONLY
4611 ♀

92 x [19] x 20 x 16 10g. T $2\frac{1}{2}$

95 x 32 x 16 x 16 7.0g no emb.

6 km NNW Jumbona, Dept. of Puno

July 20

4612 ♂ *Calomys ducilla*

121 x 40 x 18 x 16

12g. testis 7mm dark
SV 12mm

Rio Huancayo, 13,100 ft., Dept. of Puno

chromo
4613 ♀ *Phyllotis osi*

July 21

194 x 98 x 25 x 23 21 $\frac{1}{2}$ g
caught July 19, killed July 21.
injected calomys July 19 and again
July 21

6 km NNW Jumbona, Dept. of Puno
-12,600 ft.

July 21

chromo
4614 ♂ *Ph. domini*

228 x 114 x 28 x 25 42g. testis 4mm, SV 2

chromo
4615 ♂ *Calomys ducilla*
chromo
4616 ♀

114 x 41 x 18 x 16 12 $\frac{1}{2}$ g. T $5\frac{1}{2}$, SV 10

14 x 31 x 16 x 14 9g. no emb.

4 km NNW Jumbona, 12,600 ft., Dept. of Puno

July 22

4617 *Tielaemus multiformis*

under rocks on closely

4618

grazed punpa

4619

"

4620

"

Hda. Chacayani, 20 km NE Azangaro, 13,200 ft., Dept. of Puno

July 23

4621 ♂ *Calomys sorellae*

140 x 64 x 18 x 17

13g. T $2\frac{1}{2}$

4622 ♂ *Akodon azarae*

145 x 59 x 20 $\frac{1}{2}$ x 12

16 $\frac{1}{2}$ g T 3

4623 ♂ *Calomys ducilla*

113 x 41 x 17 $\frac{1}{2}$ x 16 $\frac{1}{2}$

10 $\frac{1}{2}$ g. T 6
SV 9

4624 ♀ *Phyllotis pictus*

- x - x 25 x 20

33g. no emb.

July 24

4625 ♀ *Phyllotis osi*

239 x 127 x 24 x 23

34g. no emb

4626 ♀ *Calomys sorellae*

142 x 65 x 18 x 18

63g no emb

Pearson
1968

Colony

18 km NE Abasco, 12,600 ft., Dept. of Guerrero

chron
4627

♀ *Phyllotis darwini*

July 28

269 x 148 x 28 x 25 50g

caught by Andy Smith

22 km S Abasco, Chalhuanca, 10,700 ft., Dept. of Guerrero

July 29

chron
4628

Calomys

169 x 83 x 20 x 18 15½g.

chron

4629

♀ *abodon*

162 x 69 x 20 x 14 18g. - no end.

2 mi. E. Piquio, 11,000 ft.,

July 30

4630

♂

Phyllotis darwini

caught by Lynn Collette Testis 3mm

207 x 109 x 26 x 24½ 31g.

4631

♂

"

?

243 x 125 x 27 x 26

47g. - 5018

4632

♂

Calomys sorellus

156 x 81 x 19 x 17

14g. T3

4633

♂

Calomys

151 x 73 x 19½ x 18

13½g.

4634

♂

Phyllotis darwini?

245 x 129 x 27 x 24½ 54g. - 5016

T10

Pearson
1968

Journal

Chillon Valley, km 60, (Amiez), 4000 ft., Dept. of Lima,
P.M.

June 29

Drove up the Valley and set traps at 5:30 in a heavily-bouldered cactus slope. abundant small fuzzy Cereus and a larger 5-fluted cactus. a few spiny bushes and scattered ^{sparse} grass. Saw a few mouse droppings while setting. Lots of good cover and ? food. Night calm & clear $\frac{1}{8}$ moon.

June 30

Heard barn owl. My traps (3 can and 17 museum specials baited with oatmeal) held 3 Phyllotis (darwini & quini) Andy & Lynn caught none. the amiez was caught by the tail in a snop trap, sluggish. Even after 2 hrs in a can trap with food he didn't fully revive.

moved down valley further to skin

Chillon Valley, km 53, Yungas, 3300 ft., Dept. of Lima

Walked up rocky-cactus hillside at noon and found large mouse droppings on tops of rocks, a possum skull (fragments), and a burrowing owl, mostly insects but a few mice (saved). We are next to a cemetery, up the hill from a village with a church. Lots of stone walls, with pepper trees, shrubs. I set 7 can traps and 7 museum specials along a wall with vines & pepper trees and shrubs bordering a slightly grassy fallow field. Nearby is a row of hibiscus with lots of honeybees.

July 1

Night calm, fog came and left twice. Heavy dew. My traps held nothing. Lynn and Andy, setting along walls on the edge of rock-cactus caught 2 live Phyllotis and 2 dead. The two dead ones are darwini and probably won't get put up. All day wrestling with getting the car operating, things through customs, etc. Stayed in Lima overnight

July 2. Lina all day trying to get new owner's card. Left without it at about 3:30 pm after visiting at the Noya's where Gay Seary is staying. Poffa Noya is a good friend of Hurtado's second in command. Drove south to Durin, then inland to Pachacamac. Camped in completely sterile hills above a valley with ~~some~~ cotton, alfalfa, etc. We are at the upper edge of irrigation, with some fields of sparse grass and alfalfa, tomatoes, etc, with a few trees ~~etc~~ and bushes along irrigation ditches. A few bushes and beehs away from irrigation, but most of the desert bare except for a "scum" of blockered dry plants looking like dried algal on a beach. Set 26 ~~Sherman's~~ ^{Sherman's} ~~specials~~ and 2 contraps along corral walls etc. in almost total desert, at 5 p.m., calm, overcast. We are about 2 km NE Pachacamac, about 500 ft elevation. Andy saw burrowing owls.

July 3 Visit from police in middle of night. my traps held 1 Phyllotis. Lina had 2 mus and Andy a mus and a Phyllotis. my Phyllotis was along a corral wall, completely bare. Morning partly cloudy, partly clear. Left noon for more negotiations in Lina. Still no owner's card for trucks. Left in truck ~~then~~

July 4 Loaded up Dr. Luis Gonzales - Ungelman in A.M. He reported that Dr. Macedo is in Lina (and Koppeser still here). Talked with Macedo on phone and made date for tomorrow. Returned to Pachacamac in afternoon and stayed overnight.

July 5 3 km E. Humay, Pisco Valley, 1400 ft., Dept. of Ica
Broke camp at Pochacama and drove to Lima to talk
with Dr. Hernandez de Macedo concerning Lynn staying
at Hda Chacayam. all OK. Then headed south.
Good Tillandsia between Surin and Pucallpa
and also at about San Antonio. Flat tire at
Mala. Good sandy desert between Mala and
Canete. Stopped at one place where we saw
one lizard, foot tracks, and lots of mouse tracks,
especially along boulders below the road cut. The
only plants seen were some beens growing on
a very old skull and 1 Tillandsia across the
road a few hundred yards away.

Turned up the Pisco Valley but caught by dark-
ness in a barren corral with a few algaroba trees at
1400 ft (3 km E Humay).

July 6 Andy's traps, set at dusk mostly along a stone wall
then bare bare dry ground caught 6 Phyllotis darwini.

Left after breakfast and drove up the Pisco Valley to
10,000 ft (above Ticsapo). Cacti begin about 3,000 ft, shrubs
begin about 5,000; maximum bushes are at about 9,000,
then it begins to get bush-grassy. Had lunch by a
waterfall at 10,000, then went back to only reasonable
campsite at 8,000 ft (2 mi. E Ticsapo). Here there are
scattered shrubs, many of them spiny, some herb
covering, some saguaro cactus, some cereus
cactus, some lone fig-like trees. Not as bushy
as our Phyllotis wagneri site above Tarata nor as





Chillon Valley, 2 mi. SW Arequipa, 4000 ft., Dept. of Lima

Phyllotis amicus and Ph. darwini ↑



4 km NE Pachacamac, 300 ft., Dept. of Lima

Phyllotis amicus ↑



3 Km E Humayo, 1400 ft., Pisco Valley, Dept. of Ica.

Phyllotis darwini ↑



2 Km. E. Tiarapo, 8000 ft., Dept. of Huancabamba
marmosa, Phyllotis amicus, darwini, and magister



2 Am. E Ticoapa, 8000 ft. *Phyllotis magister*



2 Am. E Ticoapa, 8000 ft. *Phyllotis anicua*, *darwini*, *maruoso*



2 km E Tiarabo, 8000 ft. - *Phyllotia americana*, *darwini*, *magister*



2 km. E Tiarabo, 8000 ft. - *mammosa* and *Phyllotia darwini*

brushy as some of the andean weather in the
Riviera Valley. There is lupine (blooming) about
500 to 1000 ft above here. Skunk squaled on
road at 9000 ft. Evening calm and clear, moon
4/5 full.

2 km. E Tirafo, 8000 ft., (Riviera Valley), Dept Huancavelica

July 7
(Sat. Sun.)

my trap line through brush and cactus, mostly along stone
walls, 32 shermans baited with corn, 7 museum specials baited
with rolled oats. morning clear calm. Snap traps caught 2 Ph
magister and 1 Ph (~~darwini~~ ^{andensis}), live traps caught 2 Ph. darwini ^{andensis?}.

Good mouse footprints in dust along road: a big species and a
small one. Skinning all day. Sunny and warm at 5
set out 32 shermans and 15 MS, all baited with
rolled oats. Much of the line duplicated last night,
but some new ones along the road retaining wall.
almost full moon.

checked some of my traps at 8:30 pm, 2 small
Phyllotis, one big Phyllotis by ear still alive, and another
big Phyllotis dead and brain eaten. Rebaited this trap
with brain and at 9:15 caught a marumosa. Prepared
chromosomes of marumosa by culture.

July 8

night clear calm. minimum 40°. Traps this morning held no
more than last night, total: 3 small Phyllotis (one snap),
2 large Phyllotis (both snap), and 1 marumosa. no dew.


at 1:30 air temp. was 72° and wet-bulb depression 24° (8000 ft.).

at 5 pm set 28 shermans and 18 MS (rolled oats)
along stone walls at and near a cemetery near camp.

Fairly brushy along the walls, and numerous big candelabra cacti nearby. Patagona gigas was feeding on blossoms of this cactus at sunset.

July 9 Full moon, calm & clear, minimum 42°. My traps at 6 am held 12 mice, all except 1 or 2 are darwini, the others amens. Patagona was calling among the candelabra cacti when it was still too dark to find my traps. The cactus blossoms stay open ~~until~~ for at least a half hour, but the hummers are early feeders. Collected one. Another smaller hummer was also busy on the cactus flowers.

Left at noon for the east. This camp is essentially scattered brush - cactus goat country. Very heavily grazed. Not many small cacti. Interesting for its sympatry of Phyllotis darwini - amens - magister

Pisco at 6 pm after another flat tire, then about 10 km SE of Pisco to camp in sandy desert with scattered small palm trees and a Stoloniiferous grass . Set traps by moonlight (about 20 shermans and 20 ps). Lots of mouse tracks.

10 km SSE Pisco, 200 ft. Dept. of Ica,

July 10 Night clouded up early, Scotch mist in early AM. Heard horn owl. My traps held only 1 Phl darwini, 2 in Andy's. One of my traps missing, with foot tracks at same place. The mouse activity seems to center around the palms that are big enough to provide good shelter and refuge (they branch from the base). Drove all day and camped after dark on the beach about 3 km N of Chala.

July 11 Drove all day except for one stop of 1 1/2 hrs to put up

rice. Arrived Arequipa 6 pm. I am impressed at the almost total lack of vegetation between Canova and Arequipa. Bare - bare even up to 7,000 ft., and the new road passes almost no cacti (unlike my photos from a previous trip). Saw no place where I would have expected quacora, as collected in 1948 (or was it 1953?). Checked into Pension Centenario.

July 12

all day in Arequipa

July 13
(Sat.)

Left Arequipa about 10 a.m. and wound up the hill to the east. Stopped in the bushy zone at 10,600 ft., about 12 miles east. There is *Baccharis*, *Myoporum* and at least 8 other kinds of bushes, a few up to 10 feet tall, but mostly low bushes. In the bottom of a wash near camp they are especially thick & tall. Here *Patagona gyges* is very abundant. Can see 5 or six at a time, with lots of chasing, feeding, calling, etc. Two frequently "squirrel" and chase each other 100-200 feet into the air. They are feeding on a bush with large orange flowers, compound leaves with ² tendrils at the end of the leaves. Not a legume, the rusty red *Leptochloa* is here also. Lots of species of birds, have seen a dozen or more including a flock of parakeets perching on a stone wall holding up a shoulder of the road.

Put out 30 Shermans (oats) and 16 MS about 5 pm. through the brushy washland along brushy retaining walls. Evening clear & calm.

12 ~~mi~~^{mi E} arequipa, 10,600 ft, Dept. of Arequipa, Peru
July 14

July 14 Night clear, calm, half moon, min 36°. My traps held 1 Alcedo and 11 Phyllotis darwini. The Alcedo was in a spot with some bunches of ichu. Lynn and Andy caught darwini and 1 marumosa.

at 10 a.m. 41°-57° = wet-dry bulb temps, all sunny. Left camp at 1:30 and ground up the hill. Bushes still lush at 12,000 ft and still definitely brushy at 13,000 although bunch grass more abundant. Camped near 15,000 ft, probably not far from Koford's Huayllaca location at dusk. Saw no vicuñas or tinamous.

July 15 Our camp was about 1 mile west of Koford's Huayllaca, 15,000 ft. Min temp. overnight (clear) was 10° F. VW wouldn't start. Left about 9 a.m. and drove to Puno, stopping, then camped at dusk about 3 miles west of Puno on the Tacna road. All the way from Arequipa to Puno saw not a single vicuña or tinamou, even camping in the midst of Koford's study area. Heard no tinamous or vicuña either. Saddest of all, no piles of vicuña droppings where they used to be, so they have probably been gone for some time. Quite a bit of grazing by alpacas, sheep, and llamas.

July 16 Left about 8 a.m. toward Paucartambo and made camp in the gorge of the Rio Huayllaca a few miles above the bridge, about 13,100 ft. Put out 30 thermos along good stone walls - ichu. Night clear (very) and almost calm. Checked traps at 8. Nothing.

July 17 Min temp. overnight was 2° F. Still only 20° at 8 a.m. when the sun reached camp. My traps held only 1 Alcedo + 1 Calomys 2. I'm sure snap traps would have done better. Heard no tinamous. at 10 a.m. river 47°, air 43°. at 10:20 35°-51° wet bulb (13,100)* see later



10 km. SSE Pisco, 200 ft., left of La Phyllotis darwini



10 mi. E Arequipa, 10,600 ft. Habitat similar to my trap line.

Phyllotis darwini, *Akodon boliviensis*, *Marmosa*.



Aio Huarque, 13,100 ft., Dept. of Peru.

akodon boliviensis, *A. jelskii*, *Calomys lucilla*,
Phyllotis darwini, *Ph. ositae* . ↑



Hacienda Chacayani, 13,200 ft., 20 km. NE azangaro

akodon auzeus, *A. boliviensis*, *Calomys lucilla*, *C. zorella*,
Phyllotis ositae, *Ph. pictus*.



~~18 km. NE Chahuacay, 12,600 ft., Dept. of Apurimac~~

22 km S Chahuacay, 10,700 ft., Dept. of Apurimac, July 29

Comparison of thermometers: dry bulb: 45° ; wet-min #1 $44-46^{\circ}$; wet-min #2 $44-45^{\circ}$; Schuller's 4.1°C .

* This reading was swinging in shade of tent ^{and} but air temp 2" above ground in shade of box was as above (about 45°). At 10:40 a.m.: 2" above ground in breeze $31-48^{\circ}$; swinging in shade of box a few feet away $33-51^{\circ}$.

Shot one of a pair of *Zonotrichia* sitting 6 miles apart in a total bush. I don't see them in the floor of the valley in the ichu but they are not uncommon among the stone walls and *Festuca* on the slopes.

Heiked up to the west crest looking for humming-bird caves but found no good ones and saw no hummers.

Put a wet-min thermometer in a fairly deep, east-facing crevice (52° at 5 p.m.) and set about ²²~~20~~ Sheenans along the base of cliffs, mostly ichu nearby.

Bitten by ant shortly after we had left east-facing slope. Lynn also was bitten while up on this slope.

July 18 Checked the "hummingbird" crevice at 6:05 a.m. [note, no hummers actually seen here], minimum was 32° and still at minimum. The crevice is east-facing, 20 ft tall, 20 ft deep, 10 ft wide at mouth and 6 ft wide where thermometer lay on a shelf 6 ft above floor. Crevice is open to sky above, all except last few feet where there is nettle growing and another chickweed-like plant. Moss covers most of the north wall, south wall is bare. Thermometer was on south wall. 20 ft outside the crevice the temp was 22° . Sun arrived at 6:30. Returned to camp at 7 and temp was 11° . Overnight minimum at 5:30 in camp was 5° .

my traps along base of cliff - ichu with occasional Lepidophyllum
quadrangulare, Baccharis + Senecio and coihue caught 1 Aethia
jelskii, and 3 Phyllotis (1 osidae, 1 darwini and 1 not yet named)

Walked with Zym up to some cover + cliffs and recorded
a few temperatures. The sunny cliff faces out of the wind, ^(if any)
were uncomfortably warm. a few flies around and saw 1
butterfly. Saw 1 hummer.

After skimming drove to Hacienda Paurumani and got
stuck in the middle of the ford. Hiked to the hacienda, where
I found no one except the administrator + some Indians,
who hoisted + tugged the bus out of the river. Returned
to camp at 4 and found Zym very weak + tired and with
violent chills, so broke camp and drove to Jubaia,
arriving 10 P.M.

Shade temp. at Rio Haerque camp: 5:30 am 5°, 7:00-11°;
8:30-28°, 10-42°, 11-46°, 12:45-55°, 1:45-55°.

July 19 To doctor and lazing in Jubaia. Doctor thinks Zym has
only altitude sickness. Prescribed 3 kinds of pills [Dr. Efraim
Camargo?]

July 20 More lazing in Jubaia. at 3:30 drove to 6 km NW of
town across the river to a large, closely grazed, turfey pampa
with ~~so~~ widely scattered bunches of grass and scattered
cultivated fields. Turned over widely scattered rocks
and at about 4 pm found 1 snake (Tachymenis?),
1 lizard (Liolaemus?), and 3 nests of Colonyrdactylus.
These were simple grass nests under large boulders in
open pampa with no cover higher than 2". The snake and

the lizard were not very active in spite of bright sun and air temp of about 50° ; little wind. also under the stones were many big fuzzy caterpillars, colonies of big black ants, large dun-colored beetles, a bare-iridescent wasp, and a medium-large tarantula (and some "wolf" spiders).

Put out 19 shermans in fairly good rocky places with dry aster-like small bushes, on the hill just north of the river.

Saw two domestic pigeons flying over the city, and a bittern being carried along the schuall. First cat that we've seen.

July 21

Temp. at 6 am was 0°C . my traps held 5 Phyllotis and Andy's 2. One of the 7 was Ph. pictus, ~~but~~ the others probably darwini but maybe a couple of osbornei.

a Calomys lucilla alone in a cage with paper and a piece of crocker was torpid ($13\frac{1}{2}^{\circ}$) in our hotel closet ($13\frac{1}{2}^{\circ}$) and recovered spontaneously.

July 22

Left at 10:45 for Checacani. at 4 km NW Juvia we caught 4 more Liolaemus under rocks. Sunny and warm, but all were under rocks, one of the lizards cold and sluggish, the other 3 lively. at 8 km NW under a rock in closely grazed punpa we caught 4 more Calomys lucilla in a nest. Then on to Checacani, arriving at 3 pm. It is 20 km. NE azangaro. We recognized it by the Puya raimondii plants on the hill above the buildings.

Set 37 shermans up a rocky canyon bottom with fairly lush grass, herbs, occasional punpa grass,

July 23

a few big queñua trees. Lots of drooping -
night clear, frost and some ice on stream. my traps
caught only 2 mice, and these were in the grass in the
first few traps at the bottom of the line (1 akodon anwenne,
1 Calomys sorellae). nothing up the rocky canyon.

In the afternoon drove 25 min to a lake looking for hummingbird
country, but nothing good. Saw another nothura. at 5:30
set 36 shermans, half along a stone wall running along
a ridge - bunchgrass and Margyricarpus strictus with
lots of open ground, and half in the thick grass meadow
where Calomys and Bolomys came from last night.

An indian appeared at supper time with two Chinchilla
which are now ours.

July 24
(Wed.)

night clear, some ice in truck, maybe 20°F. my traps along
the stone wall on the ichu - margyricarpus hill caught three
Ph. osida and 1 akodon boliviensis; in the thick meadow
caught 2 Calomys sorellae, 1 akodon boliviensis, and
1 Calomys chilla.

at 9:30 drove with Lynn to the bottom of "Dorste"
hummingbird canyon, ± 8 km from the Hacienda, then walked
up along the clear stream. The canyon narrows as you
go up a few km. Saw 1 good cave (with abandoned hummer
nest), and three other nests on smooth cliff overhangs
on the sunny side of the canyon. (The cave was on the
shady side). as the canyon narrows there ~~is some~~
queñua trees appear, and on one slope is a "forest" of luya
much richer than at the Hacienda.

at 7 a.m. climbed part way up the first canyon east of the Hacienda and found one beautiful cave made by a large overhanging slab over which water will cascade in the rainy season. Lots of ferns in the cave and one hummer nest.

We saw only one hummer in "Lost" Canyon - a female, bathing in the stream. The stream is loaded with aquatic invertebrates but apparently no trout.

Left at 1 p.m. and camped in a sterile field a few miles short of Lucara. No traps out.

July 25 Left about 8 for Cuzco, arriving 5:30 p.m.

July 26 Lying with dysentery during the night. Andy to Machu Picchu. Stained slides etc.

July 27 Left about 8 a.m. for Abancay, delayed $1\frac{1}{2}$ hrs by truck upset - spilling passengers + cargo 500 ft into gorge. Camped at 12,600 ft at dusk a little before the pass down into Abancay (18 km NE Abancay). Put about 50 Sherman among scattered boulders, a large boecbaris, some thorny chupks, and plowed fields interspersed with grass. Night clear at first, then partly cloudy.

July 28 Nothing in my traps. Andy caught 2 big Ph. darwini. Left about 7 a.m. for Abancay (9:30), then towards Pucuro. Camped at 22 km S. Chalhuanca ^{10,700 ft} in heavily grazed grass, scrub, a few stone walls. Saw torrent ducks twice on stones in the middle of the river, ~~at about~~ one below Chalhuanca

and the other a little above. Hunt about 2 ~~at~~ *Shermansi*
in brushy rocky places along river, night clear.

July 29

Clouded up during night. My traps caught *Ph*
darwini, *Akodon boliviensis*, and *Calomys* spp. Total 8.
Between Chalhuanca and Piquiza, saw only two herds of
vicuñas (both together and mixed with grazing alpacas
and llamas). Between Piquiza and Nazca there were
numerous herds near the "Vicuña Refuge" (July 30).

Camped among huge rocks, tota, grass etc at
2 miles east of Piquiza and about 1000 ft. above it.

A few hundred yards below our camp there is
an abrupt change to large bushes of various kinds,
spiny or red-tubular flowered etc, very similar to my
memory of *Phyllotis magister* habitat near Tarata.

Put out about 24 *Shermansi* in good brushy-rocky
habitat, and 15 \pm con traps in more open rocky-
bare places. Night clear.

July 30

Barely frosty. My traps held 1 *Calomys* *sordidus*?,
1 *Akodon boliviensis*, and 1 *Phyllotis darwini*? andy and
Lynn caught *Calomys* and *Phyllotis* also. Some of the
Phyllotis are huge, but look more like *darwini* than
magister. *Patagona gigas* is here. I don't recall anywhere
where altiplano changes so abruptly to brush as
here - within a few hundred yards.

~~July 31~~

Interminable switchbacks and rocky road from Piquiza
to a desert camp between Nazca & Ica. Losing oil through
right rear grease seal.

July 31 Fox tracks at our desert camp (a trace of vegetation)
and a dead mouse on the road nearby with no vegetation
visible. Looked like Phyllotis. all morning in
Lca getting car repaired + serviced.

Pearson, O. P.

1969

catalogue # 4648-4715

Journal

Peru

Pearson
1969

catalog

Yungas, 13300ft, Dept. of Lima, Peru
June 30, 1968

4648	Didelphis			Pickups mandibles + teeth + palate.
		Dept. of Lima, Peru (Juliana? or Chacayan?)		
chromosome	4649	♂ Calomys ducilla		caught July, 1968, killed Feb 12, 1969. orange brown capsule 124 x 47 x 17 x 15 16g. Testis 6mm
chromosome	4650	♂ " "		124 x 43 x 17 x 14 17g. " testis 6mm
chromosome	4651	♂ " "		122 x 42 x 18 x 16 18g.
chromosome	4652	♂ " "		120 x 35 x 16 x 16 21g. testis 6mm

These cataloged in Berkeley in
1969 but collected 1968.
note duplicate field numbers

Lesson
1469

Catalog

E. side mt. - Pichincha, 3500± m., Prov. Pichincha, Ecuador
July 1

chrom.

4648 ♂ Thomasomys

caught by myrmecologist June 28
215 x 118 x 25 x 16 25g.

5½ km. NE San Bartolo,

Dept. of Lima, Peru

July 2

4649

Gecko

Found at noon inside a ~~60~~⁴⁰-mm military shell
in a gully with rocks, loose earth, and very
sparse Tillandsia. A KP 600 was on bare
valley floor ¼ mile away. mine could
hang by dorsally curled tail tip.

E. side mt. - Pichincha, 3500± m., Prov. Pichincha, Ecuador

chrom.

4650

juv

♀ Thomasomys

July 2

caught by myrmecologist June 28

169 x 96 x 23 x 15 12g.

chrom.

4651

♀

Thomasomys

July 3

caught by m. Jorg June 28

220 x 123 x 25 x 18 28g. one large fetus
23mm long and
weighing 3.8g.

5½ km NE San Bartolo, 100 m., Dept. of Lima, Peru

July 5

4652

Gecko

collected at night on soft
desert. air 14°. Droppings

4653

"

" contain insects.

4654

"

"

4655

"

"

4656

"

"

4657

"

"

4658

"

"

4659

Lizard

On bare sandy desert
in burrow

4660

Lizard

"

4661

Booby, skull only, pickup

7 km SSE Chilca, 2 m., Dept. of Lima, Peru

4662

"

4663

"

4664

~~Cormorant~~ skull only, pickup.

4665

Cormorant

"

"

1969
Pearson

7 km SSE Chilca, 2 m., Dept. of Lima, Peru
July 6

chromo
4666 ♂ *mus* testes 5x3 158 x 77 x 18 x 14

4667 skull only (skulp), inca terr.

4668 lizard

2 mi SW Casapalca, 13,300 ft., Dept. of Lima

chromo chromosomes July 8
4669 ♂ *Phyllotis andinum* 228 x 122 x 27 x 22 testis 10 mm 30g.

4670 ♂ *Calomys* 137 x 62 x 20 x 18 13g

chromo 2 mi N. Casapalca, 14,400 ft. Dept. of Lima
4670 ♂ *Calomys* ~~chromosomes~~ *sorellus* 137 x 62 x 20 x 18 test. 5.5 13g.

chromo
4671 ♀ " " 135 x 62 x 18 x 15 13g. no emb.

chromo 2 mi. SW Casapalca, 13,300 ft., Dept. of Lima
4672 ♂ *Phyllotis andinum?* 166 x 75 x 21 x 19 20g. testis 7

chromo July 9
4673 ♀ *Calomys* *sorellus* 138 x 60 x 18 x 16 14g.

July 10
4 km ENE Pucallpa, Peru, Dept. of Lima
4674 ♂ *Phyllotis andinum* Caught by Carroll Pearson testis 7 1/2 186 x 110 x 22 x 22 17g.

8 mi SE Chilca, 150 m., Dept. of Lima

July 11
4675 Lizard *Tropidurus* *chrysolaemus* In Tillandsia - sand

4676 Gecko *Phyllotrichus* *microphyllus* " "

4 km ENE Pucallpa, 1000 ft., Dept. of Lima
4677 Lizard Rocks, columnar cactus, some loma forks

8 mi. SE Chilca, 150 m., Dept. of Lima

July 14
4678 Gecko *Phyllotrichus* *leptophagus* Under dead Tillandsia near Calhoun line

July 15

skull only
4679 ♂ mus
skull only
4680 ♀ "
skull only
4681 ♂ "
skull only
4682 ♀ "
skull only
4683 ♂ "
skull only
4684 ♂ "

on grid. T3 $\frac{1}{2}$, SV2
153 x 76 x 19 x 14 10.4 g.
ut. juv.
127 x 62 x 12 x 12 7.1 g.
test 3 $\frac{1}{2}$
135 x 68 x 17 x 12 8.2 g.
ut. juv.
122 x 59 x 17 x 13 8 g
test 3
148 x 75 x 18 x 13 10.0 g.
test 3m
120 x 60 x 16 x 12 8.2 g.

7 km SSE Chilca, 2 m, Dept. of Lima

July 18

4685 ♀ mus
4686 ♂ "
chromosome
4687 ♀ Oryzomys

caught by Ray Hallow ut. juv.
131 x 65 x 17 x 13 7.2 g
caught by Ray Hallow
149 x 79 x 18 x 14 10.1 g - test. 3 $\frac{1}{2}$
caught on Colson by myrat Long
298 x 151 x 32 x 21 76 g no seeds
no emb.

July 19

4688 ♀ mus

caught by myrat Long. no seeds
142 x 71 x 17 x 15 11 g - or emb.

15 km. NNW San Luis, 10 m, Dept. of Lima

July 20

skull only
4689 ♀ Dusicyon

D.O.R. no emb. no big follicles
850 x 270 x 135 x 92

5 mi E Yangos, 9,000 ft., Rio Canete, Dept. of Lima

July 21

4690 ♀ Phyllotis andini?
4691 ♀ Phyllotis andini
chromosome
4692 ♂ Ph. andini?

[191] x [84] x 26 x 23 no emb.
ut. estrous
181 x 100 x 24 x 19 20 g. ut. juv.
no emb.
222 x 120 x 26 x 21 28 g. test 5

8 mi. NE Yangos, 9,500 ft., Dept. of Lima

July 22

4693 ♂ Phyllotis magister
chromosome
4694 ♀ Neotoma lat

test 9,506
250 x 137 x 30 x 24 52 g.
91 x 0 x 15 x 16 40 g. 1 emb.

5 mi E Yangos, 9,000 ft.



5 mi. E. Yungay, 9000 ft., Dept. of Lima

July 22

formalin

4695 *Patagona gigas*

4696 ♀ *Phyllotis ardini*?

caught by ^{mist} net over river.
Repetto-Elton 2 emb.
225 x 115 x 25 x 23 36 g.

Papa León Tree, 5 km E Pucallpa, 100 ft,
2000 ft,

July 23

4697 ♂ *Amazilia amazilia*

esoph. with green insects.

♂ testes 1 mm 5.6 g.

4698 ♀ *Pyrocephalus rubinus*

ov. 1 mm. follic. 15 g. oss. com.

4699 ♂ *Spizella magellanicus*

skull oss., 13 g. test 1

Pomacocha, Yauli Valley, 14,200 ft., Dept. of Junin.

July 27

4700 ♂ *Akodon boliviensis*

testes 3
136 x 59 x 20 x 11 14.5 g.

4701 ♂ *Colonyz ducella*

test 6
127 x 53 x 20 x 18 13 g. SV 6

4702 Toad

4 toads huddled together under iron

4703 "

plate near edge of lake

4704 "

4705 "

8 mi. SE Chilca, 150 m, Dept. of Lima.

July 29

skull only

4706 ♂ *Mus*

[83] x [10] x 17 x 13 test 4 mm, SV 3

skull only

4707 ♀ "

[80] x [15] x 15 x 12 uterus full.

skull only

4708 ♀ "

147 x 72 x 17 x 13 uterus full.

skull only

4709 ♂ "

117 x 58 x 16 x 12 6.8 g. test .2 mm

skull only

4710 ♂ "

138 x 68 x 17 x 12 8.3 g test .4 mm

chromosomes

4711

Pomacocha, Yauli Valley, 14,200 ft., Dept. of Junin

Akodon boliviensis

150 x 63 x 20 x 14 16 g.

caught by Roy Hall

Pearson
1969

8 mi SE Chilca, 150 m, Dept. of Lima

July 30

4712	♀	Oryzomys	rockpile, across road, no emb.
4713		Sechura	229 x 123 x 30 x 20 39 g. ^{stomach}
4714		"	under cordoned area.
4715		"	" " " "

Journal

July 1

Papa Fern Tree, Dept. of Lima, Peru

not light until 6 a.m. a few mosquitoes during the night. Ran traps set by myself, Carol, and Ray. Drizzly-overcast at 6:30 a.m. Traps were in stony and earthy desert with small sick columnar cactus (not fluted) with lots of beehives on it. About 130 live traps baited with rolled oats. Caught four Phyllotis darwini at the top of a hill above Carol's line ~~near~~ the vegetation got richer with sorrel, a mousecat, etc. at one place found some rat-sized droppings. This location is about 4 km ENE Kussana, 1500 m.

lots of moths (small)
Carol saw lizard

Then drove about a km north to a patch of Tillandsia in earth + stone desert, including arranged stones of human origin. Saw large scorpion, no mouse tracks. A few of the Tillandsia are blooming.

Then drove about 12 km S to a rich area of Tillandsia along the highway. Saw a few mouse and bird tracks in the Tillandsia and lots of mouse tracks close to the highway, sometimes only a few feet from the paving. Further from the road we followed one mouse track 36 yds and another 80 yards - ~~both ends not~~ ^{neither end} found.

Lots of tracks & signs seen in the three places mentioned so far.

Then drove up the canyon east of Papa Fern Tree. Various branches of road go up side canyon. We followed one to an area with large shrubby yellow



4 km. ENE Pucallpa. July 1.



5 1/2 km NE San Bartolomé. Gecko habitat. July 2, 1969. Pucallpa, Tilloandia



5 1/2 km NE San Bartolo. July 2, 1969. No mice



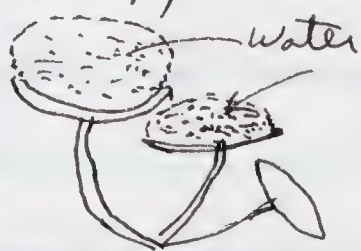
Tomasa. 10 km ENE Pucurana. July 3. *Onychomys leucogaster*

Pearson
1969

lilies coming up through stony rubble. Lots of 4-foot columnar non-fluted cactus, sord, and other green herbaceous plants. Heard numerous birds. Saw no mouse droppings. In several places, hundreds of tiny di-cot seedlings were coming up.

Skinned during afternoon, then at 4:30 drove to the Tillandsia south of Chilea (Speedometer read 7.6 miles south, top sheet looks like > 8 miles, call it 8 miles SE Chilea, 150 ft. Carol, myrmol + key set about 107 Sherman, and Anita + I set about 25 large Sherman, about half of them along the road and half in pure Tillandsia.

Foggy all day, or cloudy, occasionally drizzle. One cute low plant seen was small green like a diminutive miner's lettuce with globes of water sitting on top of each leaf. Seemed to be increased surface tension so that the glob of water was unusually tenuous. Picture slightly exaggerated.



July 2

Lots of garra during night and early morning. Ran traps at 7 a.m. nothing along the highway where all the tracks were, off in the Tillandsia located 4 mus and 1 Ph. browni. Released all. The mus made no tracks when running away. It's about a half mile to the nearest agriculture (cotton etc.). Numerous foot tracks, plus foot disturbance to some traps. The only L. hylobius was on the very top of a hill under a

man-made pile of rocks (= shelter hunting?).
In two places were very large rat-sized tracks,
hence at least 3 sp. of rodents in this Tillandsia.
Also tracks of Burhinus but didn't see the bird.

Picked up these traps, and looked for better habitat
east of San Bartolo. Went about 4 miles up. First on an
army artillery range where there was lots of Tillandsia but
mostly dead, then about 4 miles up a valley to the east of
San Bartolo past a cemetery and various trash heaps.
Stopped where the valley is about $\frac{1}{2}$ mile wide with rocky
Tillandsia on the north and sandy Tillandsia on the
south; the dry wash in the center has a few pepper trees
and numerous but isolated flowering plants, many of
them growing out of slightly damp grey ^{clay} dissected into
gorgeous mud cracks. The big Tillandsia on the rocky
north slope stops right at the bottom of the slopes and
is replaced on the flats by the small-leaved (1-inch)
species (which are very scarce and scattered).

at about 1:30 pm put about 35 small Thomomys
baited with oats + corn up a ridge through rocky - pure
Tillandsia. Not many refuges, and saw no mouse tracks
or droppings. One repton look-out post but no pellets.
Lots of fox droppings.

On the way down a steep rocky gully with very
sparse Tillandsia I saw a rusty artillery shell
and upon looking into its cavity saw a spider exoskeleton
and a live Gecko. We have looked under hundreds of

rocks etc without seeing any lizards. Shortage of
refuges? Anita found another gecko (diff species, I think),
in a small hole in bare bare flat earth about $\frac{1}{4}$ mile
away.

Walked through the sandy Tillandsia also; good
spread of Tillandsia ~~off~~ but saw no mouse tracks. Again
lots of fox tracks. Saw no birds in either the rocky or sandy
slopes.

Togged mice: 101 ♂ mus non-scrub 1st RH trap

102 + 103 ♂ " " " ML

104 ♂ adult Ph. dar hilltop RH ~~maybe~~ ~~antennae?~~

105 ♀ ML mus, veg. clod

106 ♂ AK Mus non-scrub

July 3 Ran traps about 8 a.m. Still overcast but not as
much gamma as yesterday. Nothing in my traps or Roy's
in the rocky Tillandsia ^{5 1/2 km NE San Bartolo}. Saw butterfly and found dead dragon
fly. Roy, my real ad Carol set about 110 shrews in
the sandy Tillandsia at 10:30 a.m. Efflored around. Found
a cache of pellets under a bush in the arroyo - all insect
remains except a few lizard ^{or gecko} bones; maybe sparrow hawk or
burrowing owl. A big buteo type hawk flew over, and
Carol found a burrow in a bank occupied by 2 Geckos.
Anita found another Gecko out in the middle of the valley in
a hole made by 50 caliber machine gun bullet - along with
the bullet.

In the middle of the afternoon drove up the
valley east of Popa Lion Tree. Road ends in a

bowl about 10 km ENE Pucallpa, 250 m. Some big yellow lilies and many other species of flowers blooming (*Troddeantia*, *Begonia*, sours, etc.). Thousands of little seedlings just coming up, plus moss, lots of lichens, and acres of the the algal seaweed. Several corrals of stone. Kids put out about 65 museum specials.

Road crossing at 8 pm to about km. 75. Saw one mouse, probably *Phyllotis*, which took refuge under a rock and then escaped. Also a mouse peering out of a hole under a roadside ledge. We probably cruised about 5 miles of desert slowly and another 5 miles ~~fast~~ of desert and cultivation faster. The *Tillandsia* patch 8 miles SE Chirca had lots of wolf spiders. Mostly in the *Tillandsia*, some along the road, very few in the bare desert between.

July 4

Drearest but little game. Traps up the canyon from here (10 km ENE Pucallpa, 250 m) caught only 1 *Oryzomys* *faulstichus*. The 110 live traps in the Quebrada Cruz de Huevo (5 1/2 km NE San Bartolo) caught nothing. Carol saw tracks of one mouse and fresh tracks of *Burhinus*? ^{Cruz de Huevo} way out in the pure sandy dunes on the ~~east~~ south side of the valley. Myrval found another 40 mm shell and it had a gopher in it. (= 3 shells found, 2 of them with gophers in them. We have now ~~found~~ excavated scores of "spider holes" and exploded dozens of granite boulders and found only 2 other gophers (in holes, one of them no hole gun made). Why don't they use the mud

cracks, rocks etc. that are available?

at 12:30 pm: cloudy bright, no shadows:
Schuller's thermometer in open: 19.6°

In 40 mm shell lying on ground 21.6°

Shallow sandy gravel (bulb just buried) 22.4°

Under flat rock 21.0°

at 3:30 went back to Quebrado de Cruz de Hueso
 $5\frac{1}{2}$ km. NE San Bartolo to camp overnight. I set 10 mouse
Spears and 20 shermans along the arroyo (a pepper tree
about every 100 yards, 1 caña brava, fuchsia-like bushes, morning
glory, lantana?, etc.). mouse traps in one place. Anita set
30 mus. spears along the arroyo also, and bag 20±.

The valley floor seems to be of about 2 levels: a flat soft
earthy sand ~~about 20 feet~~ tall about 20 feet above a
hard mud flat into which some gulleys are cut. The
hard surface seems to be a series of mud flows a few
inches thick. In one place we could see the edges
of 3 successive flows. Some of the flows have ~~the~~ parallel
mud-cracks (not hexagonal).

Went jacklighting at dusk but saw only
4 huge moths; at ~~7:30 went~~ covered the hard
mud desert but not the soft. Then at 7:30
went upon the soft central mesa to look for
geckos. Found seven. Following temperature data
with Schuller's thermometer: see next p.
gecko - air 14.2° , just under surface:

Time	Gecko temp	air temp.	just under surf.	deeper
7:30		14.2	15.5	18° 2" down
7:40	20.4°		15.5	17.8 3"
8:20	19°	14.7	16°	17.5 2 1/2"
8:30	18° (fat tail)			
8:35	20.4°		17.5°	17.6 3"
8:40	18.4	14.4		
8:45	16.2		15.6	18.0 4"

Overnight minimum temp was 55°. Saw no spiders while ^{hunting} geckos.

July 5

Distance between geckos 86 yds, 33 yds, 45 yds, 130, 60. Soil temp at 4" = 17.5° at 7:30 a.m.; air 14.4; surface 15°. My traps in the arroyo had 1 live Phyllotis ^{+ amicus} many licks stolen by tiny nocturnal ants. Nothing in 3 foot traps. Day had one Ph ant-eater in snap trap, probably amicus & nothing in ant's live.

ants caught two lizards on the hard desert in minima-mound like areas of soft sand surrounding burrows.

air temp at shiny table 11:30; 17.7. Rectal temp. of large fat-tailed gecko in paper cup: 20.2. at 11:45: air 18.0; rectal 19.5.

Drove up to the Capila de Carinya (11 km NE San Bartolo) at 8 a.m. Lots of green Loma animals plus some small bushes, numerous snails, a few poisonous large beetles? larval, seed-snipe.

The gecko faces were full of insects. The live amicus? when handled and caged were leapy and frantic like unicus, unlike

darwinii limatus x

about 30 pellets (small owl or sparrow hawk) from $5\frac{1}{2}$ km NE San Bartolome contained 1 pr lizard jaws (too big for gecko), about 6 scorpion ~~stingers~~ stingers and 20 big black "stingers" 6 from something else. A similar quantity of weathered out along with the pellets was a small rodent mandible not mus and a larger pelvis (Oryzomys size).

a similar quantity of pellets from 10 km ENE Pucallpa (buvungur) contained many more scorpion stingers (86 prs of pincers + 50 stingers), 1 small rodent not mus, plus 1 very small mandible, plus leg bones.

at 3:30 drove to a beach at 7 km SSE Chilca. Behind the beach are ponds surrounded by tules, fields solid with dense Distichlis, an old abandoned cotton field full of weeds, Distichlis, and live and dead cotton plants. The beach is bordered by various succulents. I put 30 Shermans through the weedy cotton. Lots of mouse + rat footprints. Others put snap traps along beach edge, and Shermans along road of distichlis.

Fairly bright sun today for first time since we came to Peru (middle of day + afternoon).

July 6

Ran traps at 6:30. 16 mus in my live. mus in my pool and Anita's live, and 1 mus, 2 Oryzomys in Rags (both along the beach). Dusk all afternoon. Went back up the valley east of San Bartolo to recover some forgotten traps. Flat tire and jack wouldn't work.

Then went to the beach at Puerto Viejo (our location 7 km SSE Chirica) with the Daineses and with Manuel Pledge, local ornithologist. Carol showed them Burhinus and Pledge collected one for us.

Just before dark the boys set Shermans in the Tillandsia.

July 7

Nothing in traps. Left La Grana Tree about 7:30, stopped at Sears for fuel, then drove up to a camp above Casapalca (our altimeter reads 13,620 ft; 2.5 miles by road). Good altillo bunchgrass habitat. Carol, myrval + I put 40 small Shermans and 70 large Shermans in lupine, sereno?, and rocks below Casapalca. Ray put small Shermans + M.S. in the bunchgrass-rocks. Every color, clear, cold. On my trap line, mixed in with the lupine were sereno, nettles, calceolaria, some other bushes, and scattered weeds and grasses but no bunchgrass. My line was on the south side of the valley; lots of bunchgrass on the north side. Carol and myrval's habitat about 2 mi. SW Casapalca, ^{13,300} ft. camp 2 mi N Casapalca, 14,400 ft., Dept. of Lima.

July 8

Night cold, clear, $< -4^{\circ}\text{C}$. Ran traps at 7 a.m. My line had 1 Ph. darwini, 4 andersoni, and 2 long-tailed Calomys. Carol had 1 andersoni, myrval 0 (big folding Shermans).

Ray caught 1 Ph. darwini, 1 Abodon jelskii, Calomys ducilla, and long-tailed Calomys. Some of his traps were out in a patch of short vicuña grass scattered with boulders and some along a steep gulch with stream and lush bunchgrass.

at 5 pm put traps down the valley again at 2 mi. SW Caspico, 13,300 ft., hoping to get Lh. darwini, but habitat is still somewhat bushy. I put 18 big shermans along stone walls, Ray put 21 small shermans in a big talus, and myrval put 18 in a rocky gulch. Anta about 10 around camp.

July 9

night cold clear; at 6 am about -5°C . Nothing in Carol's line (a re-trap of Ray's gulch) although 3 NS stolen by something. Nothing in my big shermans, nothing in myrval's, and in Ray's talus: 4 postialis and 4 Colonyx sorrellus, anta + myrval suffering from Diroche. Drove down to San Mateo for breakfast, then Lima for a stop at Davis', then "home" to Pofa Leaf Tree at 1 pm.

Carol + myrval set 28 small shermans at dusk at 4 km ENE Pucallpa, higher up on the hill where vegetation is a little "lusher" and where we had seen big rodent droppings before.

Pofa Leaf Tree, Dept. of Lima

July 10

Carol caught 1 Lh. amicus. In fact, observing the capture mice, it now appears that one of the four mice caught at 4 km ENE Pucallpa on July 1 was an amicus instead of darwini as listed. Darwini lunatus is a docile, quiet beast, whereas amicus is much jumpier, wilder, and its tail skin slips off readily. Darwini postialis is even more docile and cow-like.

In am (garra) went with Davis + crew to set up grid on the study area at km 80½, 8 miles



Chivchar, 2 mi. N Casapalca, 14,400 ft. July 9



2 mi. N Casapalca, 14,400 ft. Hillborn tuff line: Ph. darwini, Akodon felchii, long and short-tailed Calomys



2 mi. SW Casapalca, 13,300 ft., lupine + grass. Troops caught
Ph. andium and derunini, long-tailed Calomys



2 mi. SW Casapalca, 13,300 ft. July 9. Lupine, Senecio, etc.

southeast of Chilca: 12×12 at 50-foot spacing = $302,500 \text{ ft}^2$
= $\pm 6\frac{1}{2}$ acres, then at 4:30 pm set small shermans at
alternate stakes beginning with A1 (A1, A3, A5...; B2, B4...)
effect had to use about 12 big feeding shermans to fill out the grid.
all baited with oatmeal x

July 11 Ran traps on the Tillandsia grid at 7:30 a.m.: 7 mice
and 1 Phyllotis amicus as follows:

C1 - #107 mouse ♀ Vag. not open

E1 - 108 " ♂

F2 - 109 " ♀ Vag not open

I3 - 110 " ♂ young

B6 - 111 " ♂ "

B8 - 112 " ♂

C9 - 113 " ♀ Vag. not open

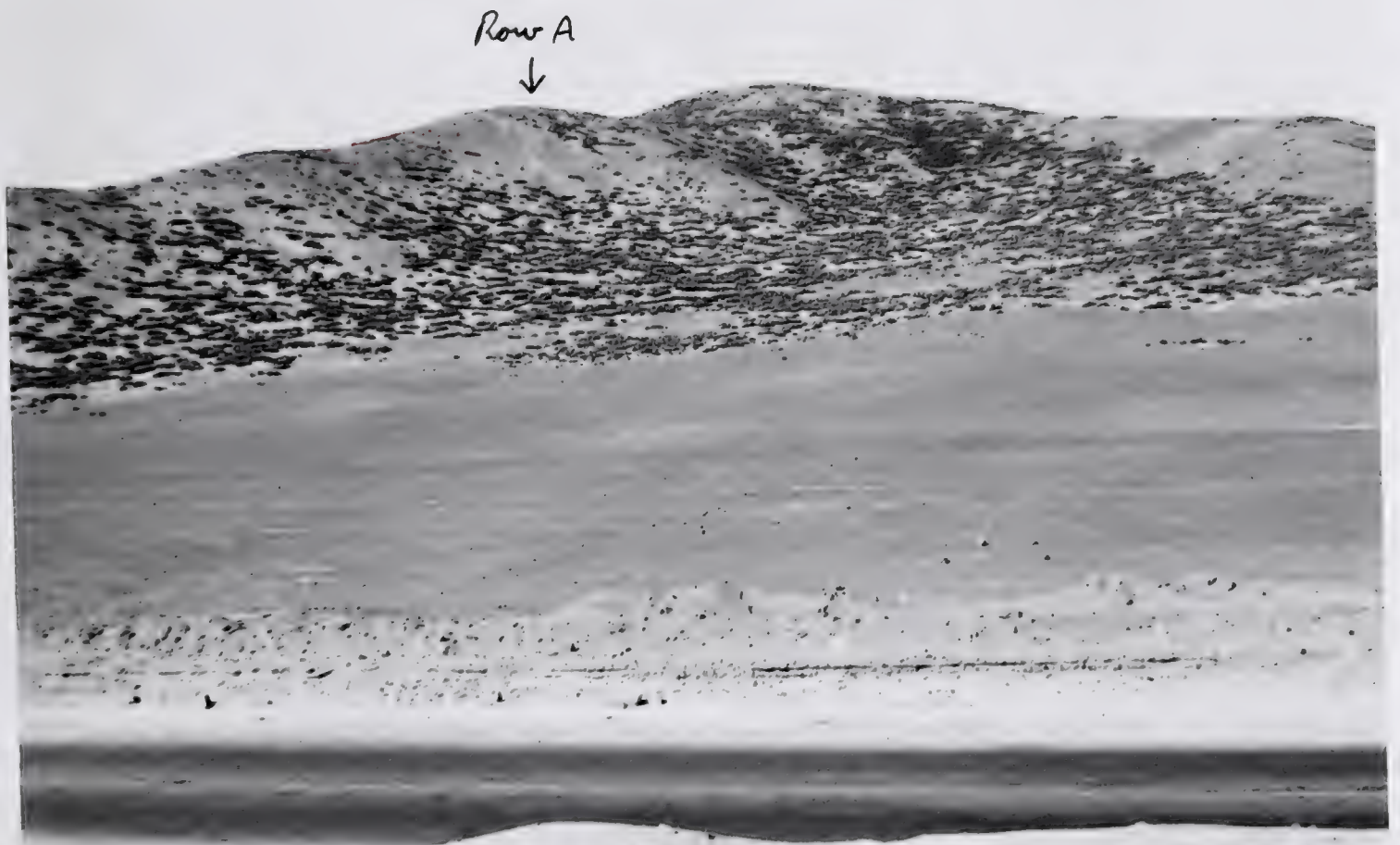
D10 - 114 Phyllotis amicus ♀ vag. not open. Ran to rock pile
at C10.

Tagged and released all. The Ph. amicus near the rock pile makes
me wonder whether the Phyllotis tagged 104 on July 2 and called
darwini was not really an amicus. He was caught near C10.

Tracking mice north of the area gave minimum mouse-trail
distances of 17, 29, 16, 11, and 20 yards. Carol caught a
lizard north of the grid - it took refuge in a big Tillandsia mat.
She also saw one large scorpion and collected several species
of spider, thysanura, etc. no ants.

One trap with mouse in it was worried by a fox.
On July 2 a fox perturbed a couple of traps also.
ants collected soil samples.

Pearson
1969



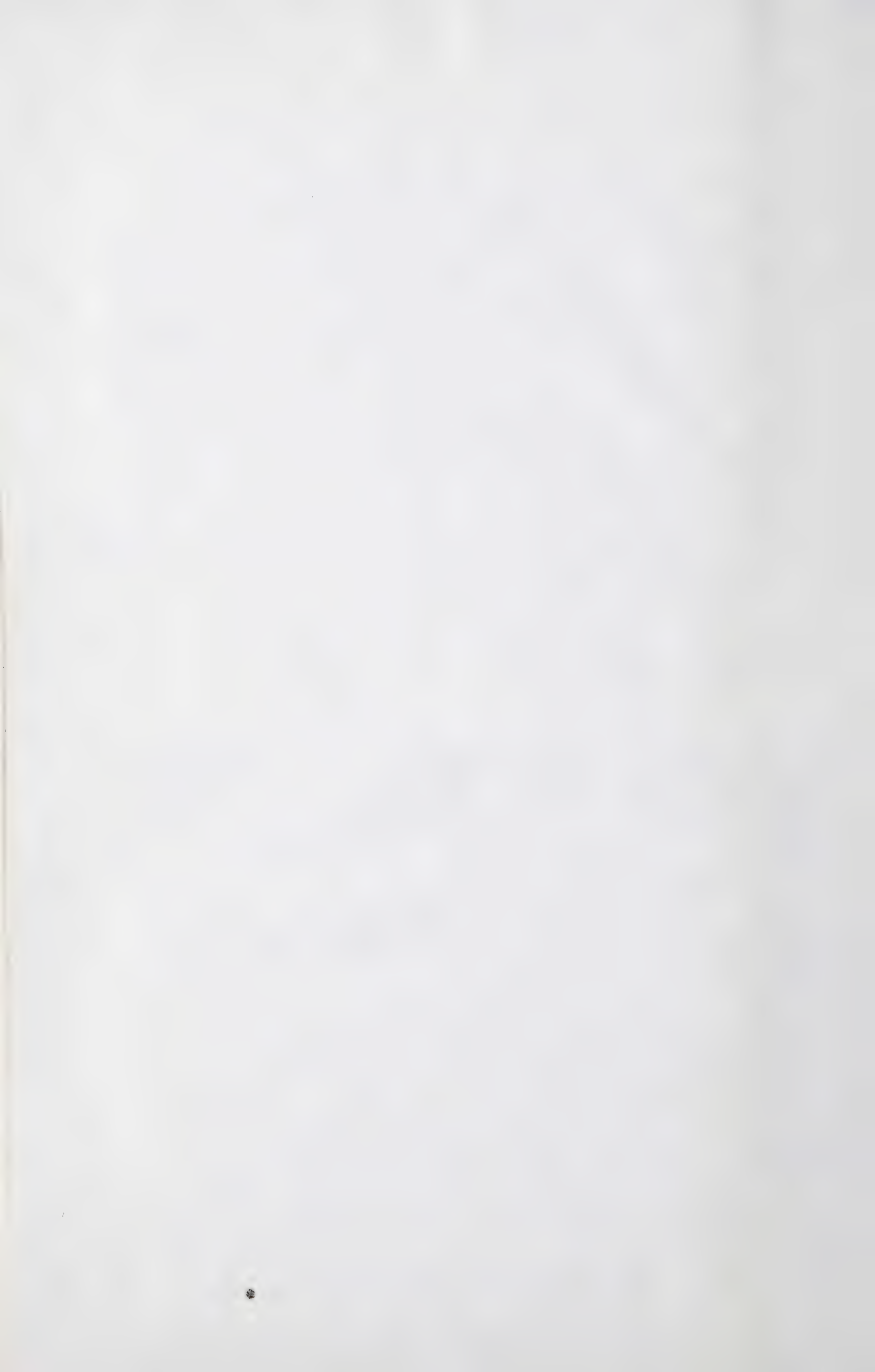
Tallandria study area, July 20 \pm . 8 mi. SE Chilca

1969



8 mi. SE Chilca. 5 birds of trees

1969





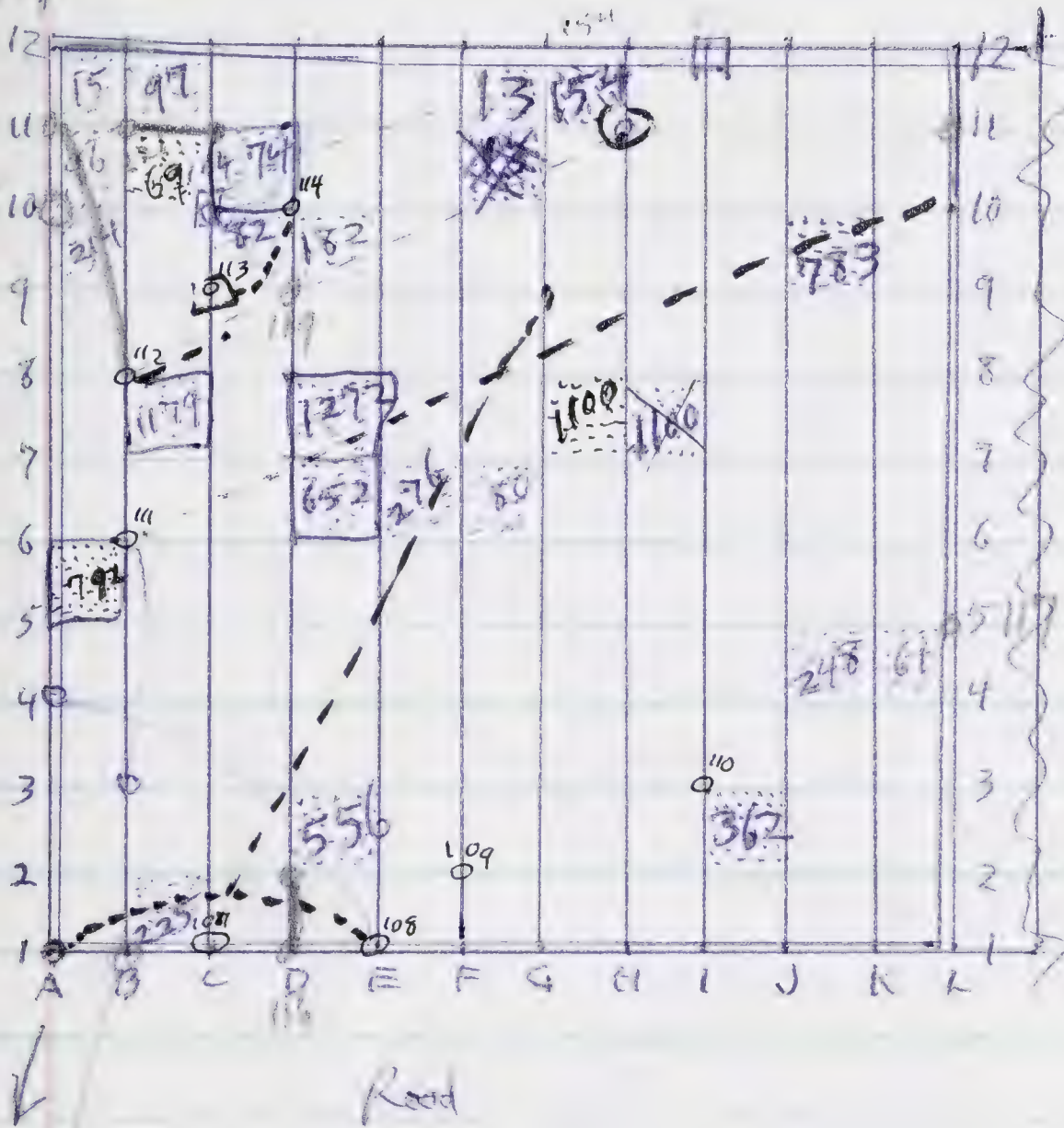
8 mi. ~~SE~~ SE Chilca, July 12, 1969



8 mi SE Chilca



700 ft to ridge
975 ft to agricultural



0001

103

103 was first caught near E1

101

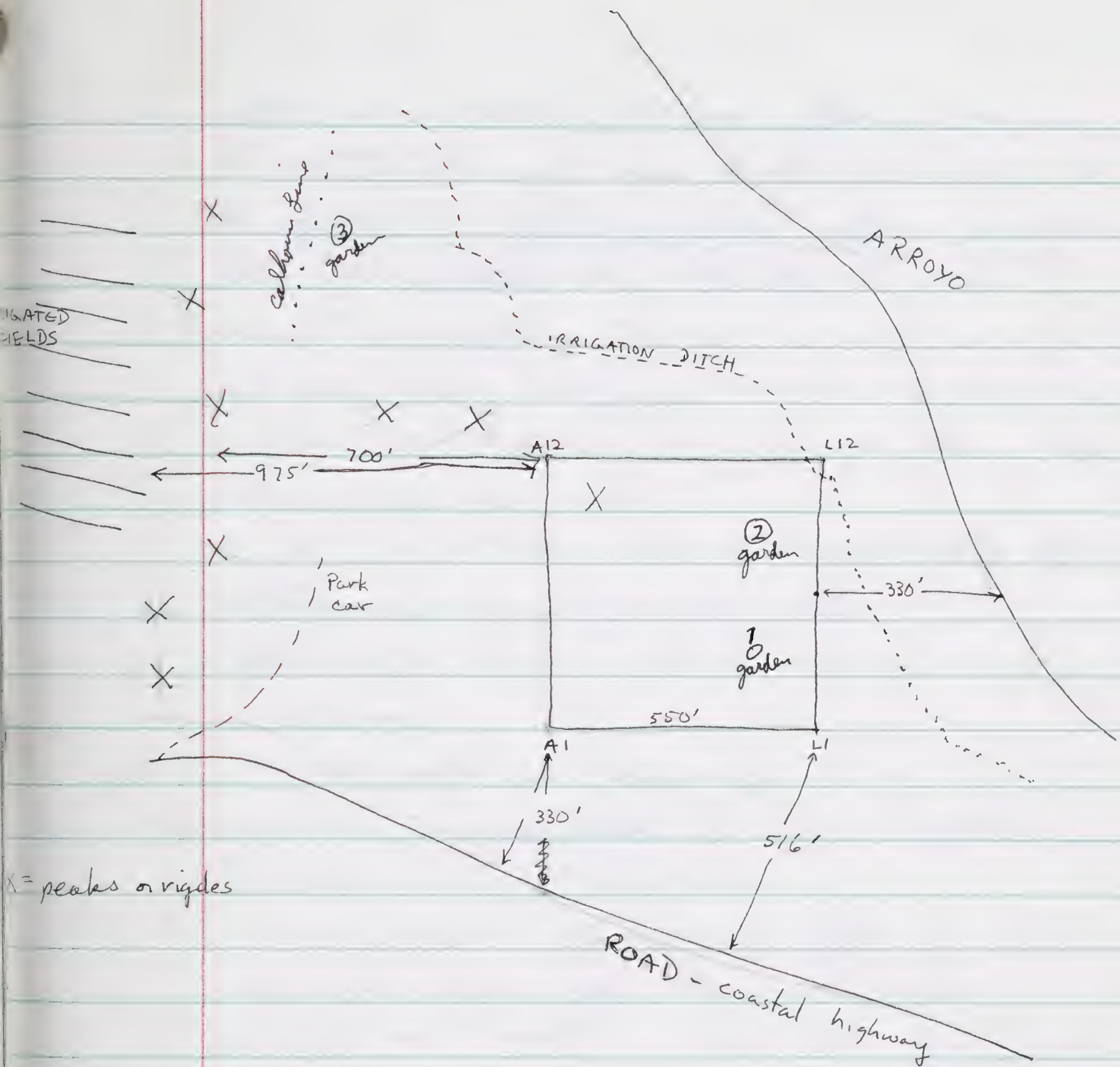
45 yds towards road from A1

bandone spiders on D6-E7, D7-E8, B7-C8, C10-B11, A5-B6,
D0 ~~on~~ A11-B12, F11-G12, G11-H12, H7-I8, J9-K10,
J4-K5, K4-L5, I2-J3, D2-E3

Map of study area 8mi SE Chilca, Dept Lima

o = peak





Measurements are ground distances

Setting of *Tillandsia* study area

8 mi. ~~SE~~ Chilca, Dept. Lima, Peru

km. $80 \frac{1}{2}$.

after lunch drove to the lily fields east of Palpa Leon Tree and climbed to the top of one of the ridges. Small columnar cactus all the way to the top. Hardly any increase in green, no flowering ^{a few line} ~~lilies~~ ^{Puyas and numerous dead ones}. Perfect rock jumbles etc for viscachas or mice but no droppings. The next ridge east has much more green (seedlings, lilies/puya, and even a couple of trees, 2 of them broad-leaved and ombu.-like, one feathery-leaved like an algarrobo or acacia).

at 3:30 set traps again on the grid ~~at~~ the alternate stations and myrual put out a Colborn line (of 50 traps) in the Tillandsia north of our area. Some sun in afternoon.

July 12 myrual counted line Tillandsia plants on 3 50-foot squares of fairly good stand: B7-C8 = 1179 plants; D8-E7 = 1272; D7-E6 = 652.

morning overcast, afternoon cloudy bright. myrual's Colborn line caught 1 mus. Our grid had as follows:

B1 - #101 mus ♂ recapt
D1 - #116 " ♀
B3 - #111 " recapt
L5 - #117 " ♂ mon-script
A10 - #118 " ♀ vag. not open
C10 - #114 " recapt
D9 - #119 " ♂

L11 - #120 young ♂ mus
I12 - #104 ^{Phyllotis darwini} ♂ recapt.
H11 - #112 " recapt
B11 - 121 " ♂

The #101 recapture was originally caught 45 yards west of A1. Tagged and released all.

myrual strung a cord across some squares and

	Live	dead	Sandy	stoney sandy	Other		Live	Dead	Sandy	Stoney sandy	Other
A7		X		X		A9			X		
B7		X	X			B9		X	X		
C7			X			C9		.			sandy entry
D			X			D9	X		X		
E		X	X			E9			X		
F				X		F		X	X		
G				X		G	X		X		
H			X			H			X		
I			X			I				X	
J		X	X			J	X		X		
K			X			K			X		
<u>L</u>	X		X			L			X		
L8			X			L10		X	X		
K8			X			K10		X	X		
J8		X	X			J10			X		
I8		X	X			I10		X	X		
H		X	X			H		X		X	
G		X	X			G			X		
F				X		F		X	X		
E				X		E				X	
D		X	X			D				X	
C		X	X			C				X	
B						B				X	
A				X		A					stoney certly sandy

sandy
entry
entry

	Live	Dead	Sandy	Stony/ sandy	oth Sandy earthy stony
A ₁₁	XXXX				
B ₁₁				✓	
C ₁₁		X		X	
D					
E			X		
F				X	
G				X	
H	X			X	
I				X	
J			X		
K			X		
L ₁₁		X	X		
L ₁₂		X	X		
K ₁₂		X	X		
J ₁₂		X	X		
I ₁₂				X	
H ₁₂		X	X		
G				X	
F				X	
E				X	
D			X		
C					Earthy sandy noddy
B		X			Earthy Sandy & only
A			X		

	<u>live Tillandsia</u>	<u>dead Till.</u>	<u>Sand</u>	<u>Stoney sandy</u>	<u>Other</u>
A1			X		
B1	X		X		
C			X		
D		X	X		
E			X		
F			X		
G			X		
H		X	X		
I			X		
J			X		
K			X		
L1		X	X		
L2			X		
K2			X		
J		X	X		
I			X		
H		X	X		
G			X		
F			X		
E			X		
D		X	X		
C			X		
B		X	X		
A2	X		X		

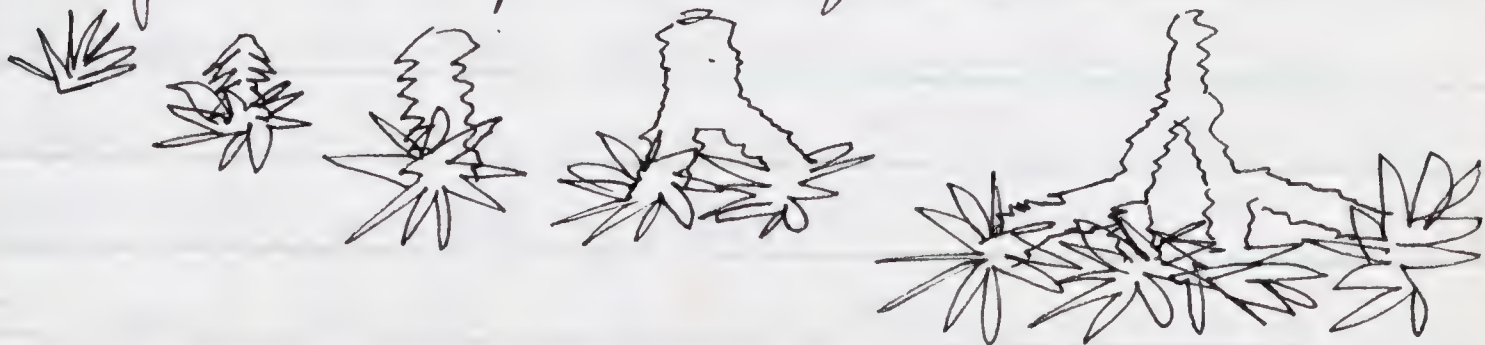
	Live Till	Dead Till	Sandy	Stoney Sandy	Other
A 3			X		
B 3			X		
C			X		
D			X		
E		X	X		
F				X	
G			X		
H			X		
I			X		lizard
J		X	X		
K			X		
L 3	X		X		
L 4			X		
K 4					Dirty sani
J					"
I			X		hole
H			X		
G		X	X		
F				X	
E		X	X		
D			X		
C	X		X		
B	X				
A			X		

	<u>Live Till</u>	<u>Dead Till</u>	<u>Sandy</u>	<u>Stoney Sandy</u>	<u>Other</u>
A 5		X	X		
B 5	X		X		
C		X	X		
D			X		
E			X		
F		XX		X	
G		X	X		
H		X	X		
I			X		
J		X	X		
K			X		
L 5					Rocky, dirty, sandy
L 6		X	X		
K 6			X		
J		X	X		
I			X		
H				X	
G				X	
F				X	
E		X	X		
D			X		
C			X		
B				X	
A 6				X	

live
and counted the number of *Tillandsia* touched and the number of them that were grazed ^{by livestock}. B6-C7# gave 3 grazed out of 19 and another one gave 6 out of 24.

Re-baited the Colburn line at 4 PM and added 10 mouse traps to make 60. The original 50 had been set all day. Also re-set the grid beginning with A1. Finished the vegetation point sample with following results: 11 live *Tillandsia*, 43 dead *Tillandsia*, 102 sandy soil, 30 stoney sandy, 9 more earthy. = 7.6% of grid covered by live *Tillandsia*, 29.1% by dead *Tillandsia*. 71% of total area is sandy.

Why *Tillandsia* grows in horizontal rows?



July 13

Slight gamma in early morning, then cloudy, then cloudy bright. Myriad's Colburn line through "control" *Tillandsia* had nothing. The grid as follows:

D2 - (116) mus

E1 - (108) mus

J4 - 122 mus non-scrub

L8 - 123 mus ♀ not open

J8 - 124 mus ♀ not open

C9 - (114) amius

F10 - 125 mus non-scrub

G9 - (107) mus

J10 - 126 - mus non-scrub

L10 - (111) mus

A11 - (112) mus

C11 - (121) mus

1 Roy measured distance from grid to irrigation with
twine = 975 ft. To ridge between irrigation and grid
was 700 ft.

Myrval counted live *Tillandsia* on the sparsest
areas and got the following counts: A9-B10 = 214;
A10-B11 = 96; B11-A12 = 15; B12-C11 = 97; C11-D10 = 74;
D10-C9 = 82; E9-C10 = 182; F7-G6 = 80; F7-E6 = 276
K5-L4 = 61; K5-J4 = 248; B2-C1 = 225.

The "nest" with 2 eggs along Myrval's Calhoun
line was dew-covered, hence abandoned.

Photographed ^{live} *Tillandsia* crossed by a random string
just north of study area (50 feet) to get area covered
by leaves. The dead leaves were covered up with
rocks. Many leaves are dead at the tip but alive
at the base, revealed by slope live dead x. On
our point samples (8 ft S.E. of stakes), a hit on
the dead tip was counted as dead *Tillandsia*.

Concerning captive mice: The domini lineatus and
postalis continue to be placid, almost boring, and the
amens wilder. The big female lineatus gave birth
July 11 and the big female postalis today (4 young). They
are not active early in the evening; in fact they seem
to be almost completely inactive until about 5 a.m.
Is this why survival is so good in live traps? They
may not get caught until 5 or 5:30.

at 4 p.m. set out the grid traps again,
beginning at A2, nothing in Calhoun. Afternoon body.

July 14 no garna in AM, although cloudy until noon. Then sun all afternoon. Nothing in Calhoun again. In three nights only one mus.

In grid traps:

B1 - (101) mus

G10 - (117) mus

D1 - (107) "

L10 - (120) "

J1 - (108) "

G12 - (104) Ph. serm.

I4 - 127 mus ♂ conserved

H11 - (112) mus

E4 - (122) "

B3 - (111) "

at 5 pm E4 - (122)

B5 - (116) "

J6 - (125) "

E10 - (114) Ph. amicus

Several traps again worried by foxes. They only bother traps with mice in them.

Max - min thermometer from 4 pm to 7 a.m. on ground next to Tillandsia: 54° - 64° F. at 3 p.m., the thermometer in the sun read 76° , when put into shade of Tillandsia it read 70° .

Ray took soil etc temperatures in AM and PM, the morning overcast, the afternoon fairly bright sun. Took photos in morning of Tillandsia, study area, tracks in sand (5 species in one photo - fox, Burrowing, 4-toed bird, large mouse, and small mouse), etc.

Left grid live traps set all day and added 60 snap traps to the grid at 5 pm plus 10 steel traps for foxes, which again bothered the live traps.

morning overcast, afternoon fairly good sun
 Temperatures with glass probe thermometer by Ray Hilborn:

	South Facing Slope		North Facing Slope		Flat	
	9 AM	4 PM	9 AM	4 PM	9 AM	4 PM
AIR 3-5"	27	35	28	33	28	30
	17°C	21	17½°	20½	17½°	18½

TOUCHING SURFACE (shaded by body)	30	48	31	43	31	35
	18½	28½	19°	26°	19°	21°

JUST SUBSURFACE	30	60	31	56	32	50
	18½	35½°	19	33°	19½	30°

UNDER TILL- ANDSIA ON SURFACE	29	38	29	39	29	35
	18°	23°	18°	24°	18	21°

OPEN GROUND 3" DOWN	31	43	30	45	30	40
	19	26	18½	27°	18½	24°

OPEN GROUND 6" DOWN	31	31	31	33	32	33
	19°C	19	19	20½	19½	20½°C

Set up a "garden" in the Tillandsia near where we park the car, about 50" x 50" and watered it with 6 gallons of Lake Leon water. Plot is bare sandy soil with 2 live Tillandsia.

July 15

Wet - minimum at 10 a.m. was 76° - 50° , current 62° .
 watered the "garden" with another 3 gallons. ^{1.12" per 3 gallons} Sampled the macro-fauna under Tillandsia mats. Dismantled the stone pile on top of the grid hill, no mice in it and no signs even of recent occupancy!

Sinetraps (72) and 60 snap traps on grid caught 3 snap trapped mice: and

#127 at E5
 #125 at H6
 #117 at G9

#112 at H11

untagged at J7

untagged at J9

#121 at L5

#122 at E4

#120 at L11

#124 at ? (not recorded)

untagged at K2

#108 at A8

#101 at A6

#116 at A10

untagged I2

#111 at G4

+ one hind foot of
 ph. dermisi in a
 snap trap at E4
 Probably #104

3 gallon water container is $14 \times 10 \times 4\frac{1}{4} = 600 \text{ in.}^3$

at 3 pm while collecting small arthropods (cloudy) 17° ,
 just under soil 21° , 3 inches down $22\frac{1}{2}^{\circ}$,

10 pit traps in 8 sets \rightarrow 3 disturbed or bait gone but
 no captures.

a pit pellet near grid held feathers, hair, 2 mice,
 1 larger mammal about rat size

20 or 30 Burhims? droppings in an area of about

6 feet across → almost entirely chitinous fragments, but one mouse bone, a few gecko bones; a few recognizable scorpion parts, and many jaws like *Stenopelmatus* jaws only smaller.

Burrowing and pellets from the ~~fly fields east of~~ Quebrada east of San Bartolo. ~~Hoyo San~~ ~~had~~ 8 or more sets of gecko jaws, mice, > 2 lizards

Spent much of the day quantifying invertebrates under *Tillandsia* mats. While doing this a laborer with shovel came along checking the asparagus east of our hill. He agrees that last year was very dry in the lomas, this year better but not good. He says cows etc. graze on the *Tillandsia* when there is no forage in the lomas. No seedlings he agrees. Two local *Tillandsia* arrangements on the hillside, "CAP" and "BIP" were made about 1946-1948.

The Hacienda San Andrés, which adjoins our area, is planning to irrigate the valley behind our hill and plant fruit trees. The hacienda gets water from 60 km? inland, from the Rio Mala — 6 days in a row, then 6 days elsewhere. He also says that rain kills *Tillandsia*, and that there are poisonous snakes lurking under the *Tillandsia* (we saw a specimen pickled in a bottle of liquor in a store in Chilca).

Went censusing wolf spiders 7-9 pm. With 5 of us moving across 50-foot squares we found as follows by eyesight.

11

Square	^{##} spiders	Other	^{##} Tillandsia per square
D6 - E7	5	—	652
D7 - E8	10	—	1272
B7 - C8	8	—	1179
C10 - B11	0	—	69 rocky top
A5 - B6	3	1 gecko	792

July 16

Went Viscacha hunting with Senores Mendoza and Reyes, who live near Jurin. With them we drove up a canyon about 2 km south of Jurin, at the mouth of which is a new satellite tracking disc. as you go up the valley it soon turns to lush green low vegetation - lilies, nettles, large-leaved Baccharis-like bushes, a few big-leaved trees, etc. Several groups of natives camped with cows, sheep, goats, and dogs. about 15 to 20 km east of Jurin there are many ~~fine~~ excellent rock slides for viscachas, but saw none. Climbed several ridges in search, and Mendoza claimed he saw one, but I saw none. Anita found droppings and one viscacha mandible. Estimated 1,000 ft elevation. They claimed to have collected 8 here in one day.

The low vegetation diminishes into and small columnar cactus about like above Chosica. Didn't see one blade of grass all day - all forbs.

Mendoza assures me that there are guanacos in these low areas and that he has seen them within 3 years. Reyes says that Tillandsia signs last at least

15 years and that *Tillandsia* is not bad forage.

at 4:30 Myrval set a Calhoun line of 60 traps across the abandoned cotton field near Puerto Viejo (7 km SSE Chilca) baited with oatmeal, and Roy set small Shermans.

July 17

no garua. Myrval's Calhoun line in the cotton field caught 2 *Oryzomys*, 23 *Mus*, 2 tails, and numerous spring - empty. at 7:30 am. Left set during day caught nothing. Roy's traps, set mostly at edge of beach (fringe of scattered succulents + low weeds between strand and *Distichlis* "fields"), caught one *Mus* and 3 *Rh. amicus*. Lots of rat-sized footprints along beach.

Morning cloudy, afternoon almost sunny for an hour or so, then cloudy-breezy. Took invertebrate samples all day and tried to bay out the *Tillandsia*. maybe *latifolia*, but the bay is too pungent for any of us.

Wet - min every last 2 days was 71° - 53° (read at 3:30 pm while air temp. was 61° . On west-facing slope).

Schultzeis just under surface nearly was 25.5° , 1" down 25.8° , 3" down 23.7° . At 3 pm on a south-facing slope, cloudy with breeze: air 17.6° , subsurface 26.8° , 1" down 27° , 3" down 24° . Under dead *Tillandsia* mat 21.2° .

Gave the garden another 3 gallons today

July 18

no garua. Gave the garden another 3 gallons. Myrval's Calhoun line had 2 *Oryzomys* and 9 *Mus*. Roy got 5 or so *Mus* at the north end of the beach. Counted bugs + *Tillandsia* in AM, almost sunny at noon.



Calhoun live in old cotton field, 7 km SSE Chilca, mus and Oryzomys

Pearson
1969

Myrmel + Ray set pit traps in PM and we all slept next to the area overnight. Jack-lighted for spiders between 7 and 9 PM with following results:

<u>Square</u>	<u>^{##} spiders</u>	<u>Other</u>	<u>^{##} Tillandsia per square</u>
A11-B12	0	—	15
F11-G12	4	—	13
G11-H12	11	—	154
H7-I8	17	—	—
G7-H8	15	—	1100
J9-K10	13	—	783
J4-K5	15	—	248
I2-J3	13	—	362

no geckos. Evening fairly warm, not windy

July 19

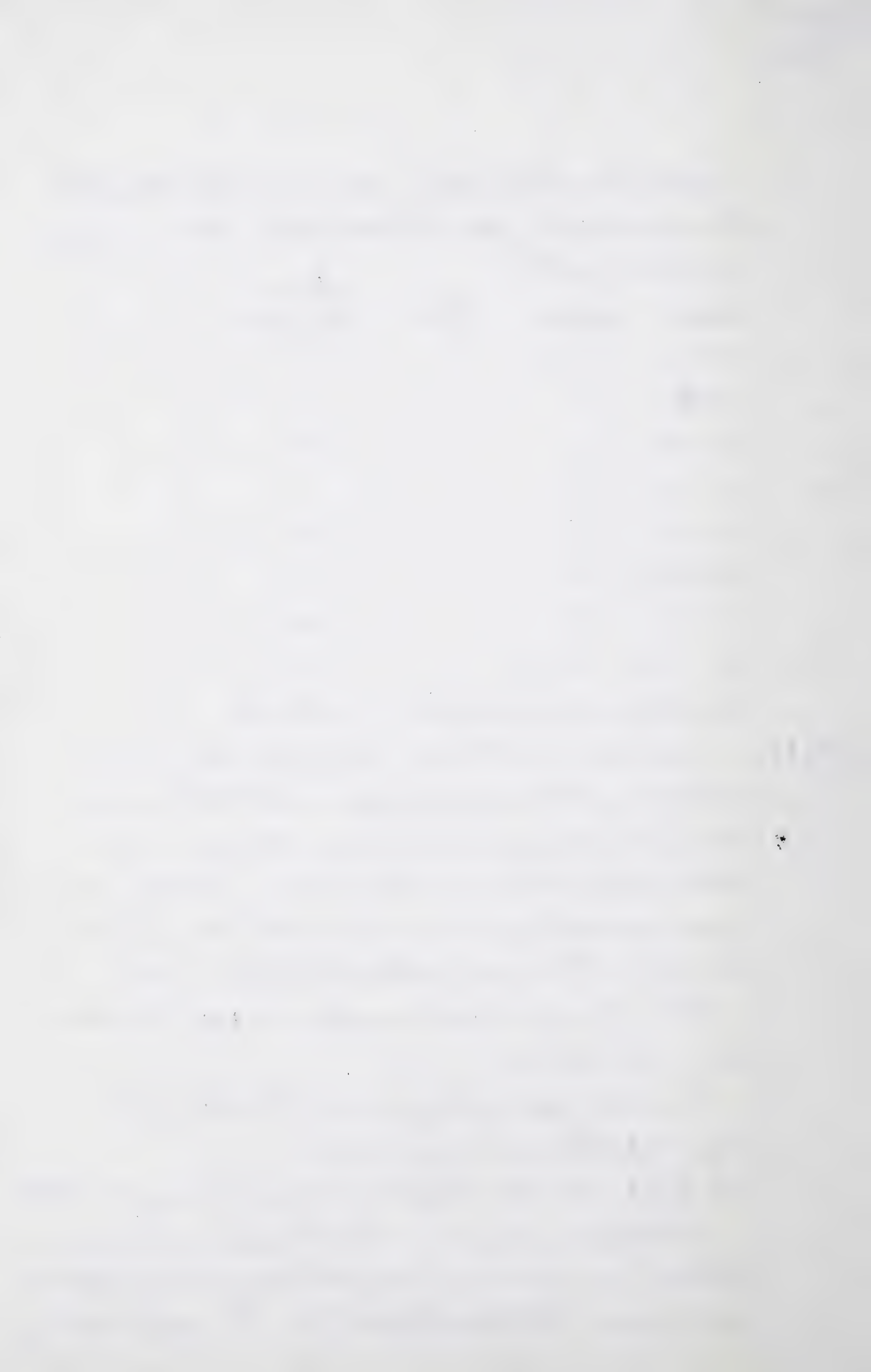
Temp. at dawn 16°. Numerous mosquitoes about 5-6 a.m. Heard barn owl twice during night, saw one bat at dawn, a broodinged hawk flew over at dawn, Carol saw some Pecho Colorado land on our hill at dawn, and saw flocks of doves fly over twice. Ray scared up what may have been a Burhinus in the dry wash while setting traps in PM.

Took a few more insect. samples in AM, then visited ruins of Pochoeanoe.

Two sets of pit droppings from near the study grid:

- ① Small bird feathers, mouse hair, mouse bones
- ② Small bird, mouse hair, Phyllotis of 2 ages, mus, a few insects.

Anta has been doing some owl pellets from east of San Bartolo (Cruz de Huesos). In one pellet she found 23 scorpions and 4 geckos. The other pellets ~~are~~ loaded with scorpions also.



1969

Number of eyeless spiders



100 200 300 400 500 600 700 800 900 1000
 T. blanda in appearance
 100 200 300 400 500 600 700 800 900 1000

X = July 15 count
 • = July 18 "

at 4 pm set 7 Sherman and 4 fox traps at the old site 4 km ENE Pucunsa. Tumbled rocks + small columnar cactus on my "line". Myrval + Ray set about 50 Sherman, apparently ^{mostly} in more open habitat.

July 20, nothing in my or Ray's traps; one phi. dominii and one phi. amicus in the lower, barren part of myrval's.

Drove south then up the Cuzco Valley. Red hill desert pts along the way. The valley is completely arid in lower parts (except for irrigation), no bona zone, then eventually small cacti, dry small shrubs, and eventually small trees such as Jatropha?, Puya, small leafed Tillandsia with blue flower draped over rocks, and at \pm 6000 ft lots of Spanish moss. The irrigated part of the valley is full of corn (all ages), yucca, cotton, tomatoes, papaya, various fruits, alfalfa, etc. Pepper trees + willow are abundant, caña for mat-weaving. at our campsite (about 10 km S Yungay, 8000 ft), the vegetation along the river bottom is grass (greenturf), Scotch broom (in bloom + pods), pepper trees, a Lombardy poplar, a few other broad-leaved trees, and a couple of small plowed fields + cows across the river. Up the slopes are candleabra cacti 10-15 ft tall, large almost leafless bush trees dripping with Spanish moss, numerous leafless succulent Jatropha? up to 10 or 12 feet tall (some just beginning to bloom with orange-red clusters coming out of the bare branches, small joint cacti, large agaves,

a few *Opuntia*, some *Juncus* on the cliffs, and numerous completely dry small shrubs + herbs, a few grasses. Plenty of rocky cover for mice. This is an east-facing slope. West more *Opuntia*.
5 mi E ~~10 km~~ ^{9,000 ft} ~~8,000 ft~~ Yungos, Dept. of Lima

July 21

Night mild, scattered clouds. Jacklighting saw nothing. Bats hunting at dusk.

My line of about 30 snags traps caught 7 *Phyllotis*, 6 of them *amurensis* and the seventh very old bob-tailed, maybe *andersoni*. Anita caught 3 *Oryzomys*? in a wall on the valley floor (not *pantaleoni*), and the others caught *Phyllotis* of various persuasions such as *amurensis*, *andersoni*?, a long-tailed *amurensis*, and maybe *darwini* *lunatus*. Morning mild, very bright sun. One *Phyllotis* in bird net.

Our location here is one mile south of Puente Tingo (km 263) at which point a side stream comes in from the east. ~~South~~ at 3:15 drove up the canyon (north) with myrnat + Anita and set traps 8 miles north of here. Still had not come to Yungos, but passed through a most impressive narrow, deep, vertical-walled canyon. I set about 35 museum specials with some meal along stone walls of many narrow terraces on a very steep west-facing slope. Numerous bushes, not all dry, agaves, and the terraces planted to alfalfa, cabbage, gourds, grain, or abandoned. a couple of sets of pampa grass.

Three bird-bat nets by 2 pm yielded 1 big ^{vampire} ~~mustiff~~ bat and one small one (escaped). By 9 p.m. one other ~~mustiff~~ bat which escaped, and at 2:30 a.m. the same net had blown down but held a second ^{vampire} ~~mustiff~~ bat.



5 mi. E Yungas, 9000 ft. East-facing slope with
Oryzopsis and *Phyllotis* *holubi*



5 mi. E Yungas, 9000 ft. near trap line. Lots of Spanish moss.
Rh. aureum and *andrium*



8 mi NE Yungas, 9500 ft. *Ph. magister* and *marumosa*



8 mi. NE Yungas, 9500 ft. *Ph. magister* and *marumosa*



8 mi. NE Yampuz, 9500 ft. - site of Ph. magister capture

July 22 Our camp location seems to be 1 mile below the junction of the Rio Cañete and the Rio Campasico (or called by one of the natives Rio Huantán). We discovered during the course of the day that ^{our} the road does not go through Yungos as indicated on all of our maps. Yungos is off to the north on a side road. We seem to be 15 miles upstream from Auco.

Ran traps at 6:30. Only one mouse in my line - a Ph. magister 4 feet up in a stone wall. Nothing in Anita's, a magister and a warmsa in my traps. At base camp Carol had nothing, Ray had ~~two~~ an Oryzomys? and 5 Phyllotis, mostly amensis. We may be getting Ph. amensis, andruin, and magister here. I don't know what the Oryzomys is. Saw a small tinamou at the 8 mi. NE Yungos location. 2 Torres ducks swam past camp, dippers, netted a Patagona, but not much in them for them.

Drove home same route except miserably short cut on old highway from Andahuayla to Asia. 8 hrs including lunch in Juliaca.

July 23

No garwa, ^{Paper from tree} fairly bright sun in middle of day. Skinned and netted birds in the back yard. John Davis told of his trip to the Cordillera Negro, Blanco, and Chavira, including good transect across Puna to forest patches, beginning 10 or 15 km S of Recway at a location Catac and going up through the Tunnel de Kahuish at the divide, then down towards the ruins at Chavín de Huántar.

July 24

Windy. Even some moonlight & stars. All day in Lima. Saw de Wardo and Ferrayra. Ferrayra assures me that our Tillandsia is

latifolia, and showed me various species growing in the botanical garden behind the museum.

July 25

To study area at 8:30. Overcast. not-min. after several days was 52° - 89° (but not. may have been full sun).

String-sample at dense plot H8-67: grazed ⁴|||| ungrazed 40

9 AM cloudy, wet-dry bulb $60-63^{\circ}$.

Weights of string-sampled live Tillandsia on above grid square beginning 9:10 AM, broken off at dead part but retaining several tiers of dead leaves. Postal scale #1.

Plant # WT.

- 1 118g. - a small double head, 1 ~~whole~~ whole dead (2 lines)
- 2 345g - large single, 3 or 4 whole dead leaves
- 3 240g - large single, 6 or 7 " " "
- (150g) - no dead leaves
- 4 134 med single - 6 whole dead
- (98) - no dead

WT with dead leaves

WT without dead leaves

455

284

double head, much dead + old seed head and roots!

172

130

single

515

438

double + old seed head

392

358

tight quadruple

213

128

smallish double

206

122

smallish double

on square J6-K5

262

208

big single

260

198

big single

—

218

" "

384

323

large single

508

420

large double

Garden #1 in a U shape on the saddle below the big letters, K4 on grid.

<u>Plant #</u>	<u>wt.</u>	<u>Description</u>
1	310g.	Big single, no flowers, 4 rows dead
2	287-	" " " " " " "
3	304	" " " " " " "
4	322	Smallish double, slightly grazed, ^{old flowers below} lots of dead
5	430	large single, 7 rows dead, red center
6	294	large single, no flower, 4 rows dead
7	420	large single with orange shot, 6 rows dead
8	175	med single, old seed head under.
9	378	large single, 6 rows dead.
10	350	cabbage head, 4 rows dead.
3270		

1 10
2 K4 9
3 8
4 8
5 6 7

at 10:45 : Wet-dry 60°-65° = 75% RH

Garden #2 in a U shape between I11 and J11 on south-south east side of hill.

#11	435	fairly large double, lots of dead.
#12	110	small, 3 rows of dead
#13	224	grazed single, 4 rows dead
#14	257	single with side bud. 4 rows dead.
#15	348	med. double, dead seed under.
#16	373	large single, red shoot.
#17	280	large single, 4 rows dead.
#18	485	large single, lots of dead

3,120 g

11	00								
12	0							0	20
13	0							00	19
14	0	0	0	0	0	0	0		
		15	16	17	18				

#32 398 triple. 4 " "

3359

21	○				○○ 32
22	○				○ 31
23	○				○ 30
24	○				○ 29
25	○	○	○	○	29
		26	27	28	

Carol + Anita measured + weighed T. dorsalis as follows:

Pearson
1969

	<u>Area</u>	<u># green beds</u>	<u>green weight</u> , <u>dead weight</u>
①	530	3	446 g 525
②	3,017 cm ²	10	1,370 2,720
③	322 cm ²	1 quadruple	400 290
④	9,800	11	2,355 3,920
⑤	1,133	3	585 620
⑥	17,027	19	3,790 10,665

at 2 pm went to the *Tilandsia* sign "B16" east of the road at the north edge of Hacienda San Andres. This is the one that a laborer 'Chief Charlie' said was made in 1946. It is on a rather bare, west-facing slope covered with fine gravel. Sand has drifted around the plants, and they are as healthy a stand of *Tilandsia* as I have seen. Loaded with seed stalks, windrows of seed fluff, long runners of dead leaves extending 32" or more up hill (and frequently ^{almost completely} buried with sand). A few mouse & foot prints, a butter flew over while we were there, and we found a dead horn owl in the apple orchard on the way to the slope.

Spider hunting after supper, saved all spiders except about 15% escapes: K4-L5 = 5; D2-E3 = 17; D3-E4 = 14; B4-C5 = 13. Evening mild, cloudy.

July 26 Off at 5:30 for Pomacocha, Yauli Valley, 14,200 ft., Dept. of Junin with Davises and Plenge. The lake (artificial) is surrounded by hills with lush ichu grass and some fairly rich *Chusquea* bushes. Spent about 25 minutes

specimens through this ichu + Chiguaspe and some rocks
at 3 pm - cool, windy ~~and~~ sunny. All batutats
more or less similar. Small rock slide across the lake
has 2 or more viscachas (Ray shot one non-preg ♀).

July 27 Morning cold, calm, clear. My traps had 1 Abodon boliviensis
and 1 Colonyx dicella. Others had some plus Phyllotis darwini.
Nobody got Ph. pictus. Nearly full moon.

Flipped rocks & boards during AM, but only catch was a
Neotomys eboratus under a boat hull at the edge of the
lake. Drove back to Papa León.

July 28 no garúa. Visited area in a.m. and re-weighed plants to see
change due to humidity etc:

#21	343 gr.	#14	248 gr.
#32	392	#18	448 gr.
11 AM	wet bulb 60:63.	#20	118
#26	160	#1	308
		#6	294

12:30 noon; wet bulb $58\frac{1}{2}$ = $59\frac{1}{2}$. Morning cloudy.

Picked up foot prints between grid and Calhoun Dec: a few fruit
seeds, but mostly mouse fur and teeth of a very old Ph. darwini and
one or more house mice. Flushed 2 Burhinus off the south
edge of the grid; They flew together, landed in the middle of
the big dry wash, and walked slowly and nervously along together.
Picked up about 50 Burhinus pellets on the area and they
contained: large numbers of insect mandibles like those of
Stenopelmatus but smaller, some scorpion claws, a few
gecko bones, assorted chitinous flakes & legs.

a fox[?]/pellet mixed in contained feathers and mouse bones.
 at 5 p.m. set snap traps (natural) on rows
 I, J, K, and L on the grid, two other snap traps at a
 rocky place on the north side of the hill, and three
 fox traps.

July 29, 1969

Garcia lost night. Shook water out of plants + weighed
 Plant #1 = 347 gr. #6 = 322 gr.

Garden #1

#2 = 310

#3 = 340

7:30 AM - wet bulb: 57 - 59 = 89% RH

① Dead Till. = 242
 to be dried + reweighed 117
 155
 514 (4 pieces)

② Live (green) Till. = 221
 291
 512 (2 heads)

265

434

total 4 heads → 1211 g

Garden #2

Plant #11 = 465 gr.

12 = 123

13 = 248

14 = 277

#20 = 134

~~19~~

17 = 300

too heavy for scale

70 drops of water gotten in dropper from a single ^{large} head.
 This one was ~~chosen~~ chosen at random on the spur of the moment, but
 subsequent search nearby revealed no others with nearly that much,
 most have none at all; a few have 10 drops or so. This was a fairly
 garish night, but did not need windshield wipers this morning.

The damp-sand crust at 8:30 a.m. was $\frac{1}{2}$ to $\frac{3}{4}$ inches thick. 18 drops from the test pipette = 1 ml. 70 drops = 3.9 ml.

Very large rat tracks went at least 50 yds across area. The 48 snaph traps on the grid caught 3 mice, one of them with torn rt. ear. The two set by rocks on the north slope caught 2 more mice. 4 of the 5 were still alive, hence dubious stomach contents. Nothing near the 3 foot sets.

Wet-min on area on July 28 at 6 p.m. after several days 55°-70°. Wet-min July 29 at 9 a.m. 53°-X. No rain in gauge.

To circumvent gross changes in weight due to garwa, humidity changes, etc., use today's sample of live and dead *Tillandsia*, weighed fresh (and somewhat soggy) and to be dried and re-weighed as a reference, then convert the garden plant weights to dry weight. Today's weights followed the first reasonably wet night in 2 weeks - at least night that we have been in residence.

at 5 p.m. put up two bat nets at the north end of the Puerto Viejo beach (7 km SSE Chirica, 2 m) stretching between clefts in rocky stacks. At dusk small bats started flying and we promptly netted two, one of which escaped. Anita set some traps for rats? among sea caves & cliffs, and Coral set some museum species across the road from our study area. I left my 3 foot traps out.

A humb dropping from the loma east of Pico Leon contained scorpion, *Oryzomys*, and *Phyllotis*. We caught a single *Oryzomys* here in one night of trapping.

July 30

With 80 snaphs of 12" insect net at 6:45 a.m. calm: nothing

100 " " " " " " " " " "

50

" " " " " " " " " "

7:00 a.m. " : "

Pearson
1969

John Davis' orange grove is 15 km. by road
north of the study grid.

Fox scat picked up near grid: 3 Mus., 1 Phyllotis
Nothing in pit traps, bait not touched. Card's 7 traps
north the stone pile and pile of dried coffee & beans caught 6 mice
and 1 spring with for insect: 2 Ph. dorsalis, (Oryz), 3 mus.

Successive weavings of dead and live Tillandsia. The
live head was a triple head with 8 branches to a spike of
seed pods

<u>Date</u>	<u>Wet-dry bulb</u>	<u>Dead</u>	<u>Live</u>
July 30 2pm	$60\frac{1}{2} - 66\frac{1}{2}$	126 g	398 g
July 28 8:30 am	$60 - 62$	132	388 g.
	3:40 pm	59-62	127 385
July 29 6:30 am	$57\frac{1}{2} - 59$	160	419
	11:40 am	$60 - 64\frac{1}{2}$	139 394

fairly good garra overnight
no garra, fairly sunny.

The bat nets caught nothing during the night but one
more small myotis during the dawn flight (which
consisted of at least 5-10 bats).

Ante finally caught a big Rattus norvegicus among the
sea coars.

Packed and left for Lima about 3pm.

Pearson, O.P.

1970

catalogue # 4729-4743

Journal

Peru

Pearson
1970

Catalog

8 mi. SE Chilca, 150 m, Dept. of Lima, Peru

July 18

- 4729 ~~Jagard~~ *Tropidomastomys* under cardboard near study area
4730 ~~Skull~~ under surface objects or in cave
4731 " "
4732 " "
4733 " "
4734 " "
4735 " "
4735 mandibles
4736 *Dusicyon culpeus* mandibles (pickups)

5 1/2 km NE San Bartolo, 100 m, Dept. of Lima

July 20

- skull only
4737 *Dusicyon griseus* pickups
4738 ~~Skull~~
4739 "
4740 "
4741 ~~Jagard~~ under flat stone

July 21

- skull only (baby)
4742 *Dusicyon griseus* pickup in front of den

July 22

8 mi SE Chilca, 150 m, Dept. of Lima, Peru

July 21 (really found July 18)

- jaw
4743 Rabbit jaw pickup in pure *Tillandsia* on study area

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8 mi SE Chilca, Dept. of Lima, Peru

July 18

Garden #3

arrived study area 2 pm. Overcast. Went to Garden 3 at ± stote 10 on myrcal's column line. Stakes still in and garden 3 apparently undisturbed. at 3 pm air 15° wet bulb 14°. Lots of mouse tracks nearby. Drip marks in sand under leaf tips. Sand moist to at least 16". Several signs of mouse tracks.

$\frac{360}{160}$ } =

520 #21 - large single, 7 rows dead leaves

#22 - 385g. large single, 4 rows dead leaves

#23 - 238 small single, 5 rows " "

$\frac{243}{275}$ }

#24 518 large single, 5 rows dead leaves

#25 - 255 large single, 6 rows " "

#26 255 large single, 3 " "

$\frac{343}{320}$ }

#27 663 double, [detached seed head]

$\frac{334}{255}$ }

#28 589 large double, old seed head under

#29 488 large single (or double with flower stalk with dried seed pods and green seed pods) 4 rows dead leaves

#30 272 med. single; 5 rows dead leaves.

#31 207 small single, 4 rows Tips missing on one row of older leaves

#32 498 tight triple, 10 rows dead leaves

old leaves feel limp, damp, & because of dampness, sand sticks to them. No signs of fresh grazing or new flowers.

4 PM - Garden #1 13° and 13.5 wet (with
some lost from garden (large tree tracks nearby)

- #3 447 large single; 8 rows dead leaves
#4 383 small double, lots of dead leaves, ^{all} flowers ^{below}
#7 495 big triple, lots of dead leaves, seed pods
on flower stalk
#8 255 med. single, dead flower down under
#9 480 big single (2 new buds); seed stalks; 8 ^{rows} dead
#10 467 med. cabbage head; 5 rows dead

4:30 PM Garden #2

- 235 }
363 } #11 598 large double; seed head down under (one head insect damaged)
#12 163 small single, 4 rows dead, ^{some} insect damage to green shorts
#13 320 large single, 7 rows dead
#14 300 ^{young} green leaves insect-eaten; 8 rows dead; grazed leaves are fairly old ones
#15 482 med. dble, ^{some} insect nibbling; still in side bud; dead blossoms under
#16 435 (displaced 1' downhill, but upright); large, doubling, green seed-head; 8 rows dead
#17 375 large single, 6 rows dead
278 }
327 } #18 605.000 large single, ^{some} insect damage; lots of dead
287 }
328 } #19 615 triple head, ^{with} 8 rows dead
#20 165 small single, 9 rows dead

Sequence of photos: plots 3, 1, 2.

General impression of the area is that things are somewhat wetter this year. The soil or sand is damp a couple of inches down in many places, and at Garden 3 (myrror's column line) it was damp 18 inches down (as deep as I went). More lichen

*Dr. Isabella Taveres says
an insect fruticose ^{pink} ^{ach}
7 *Ramschia pollinaria* (ach) ^{ach}
and a sterile lobed crustacean below.*

(mildew?) on dead plants. No *Tillandsia* in blossom but many with plump green seed pods. Lots of tracks: *foti*, *Burhinus* and redent (*mus*, *Phyllotis*, and larger). *mus* tracks incredibly abundant in places, especially near the dry wash where several "bushes" of flowering plants are in bloom or seed, with green leaves. Found a weathered rabbit mandible (sic) on the study area and a lizard and 3 geckos under surface objects just off of the study area. Our watered plot still clearly marked with corner sticks and raised rim, *Burhinus* tracks and *foti* tracks across it, and big spider burrow just outside it.

July 19

Temp at 7, 13°, gamma. Up at 5:15 with flashlight and walked across area. Saw no geckos or spiders. Temp 8:25 14½°; soil temp on S slope 3" deep 14°. 5" 14°. Tested soil moisture at various places, always ^{damp} more than 2 inches down, frequently 6 or 8". * Collected a little striped-wing fly on the area, always on pink flowering stalks. ~~also~~

Driest places are under dead mats, where it is completely dry. Collected 2 geckos on the area, both under cardboard blown up from the road. Looked under numerous good *Tillandsia* mats but no geckos there; one pair of old eggs however.

at 10 am drove to the valley east of San Bartolo. Cloudy. Road had washed out at the last crossing of the dry wash near where we had camped last year. The valley here is about ½ mile wide, boulder-stream bottom covered partly or completely by a series of mud flows, and then cut by stream gulleys. Gulleys with occasional pepper trees and

other shrubs. The Tillandsia on the south side in sand where we trapped last year (no wind) looks sort of sparse from a distance, not as lush as I had remembered. Walked up to it in P.M. mouse tracks, Burhins tracks, a large bird tracks $\begin{matrix} \nearrow \text{and } 14'' \text{ apart} \\ \searrow \\ 7'' \end{matrix}$. Large broad banks ~~leaved~~ on rocks in tillandsia. and Anita saw a sparrow hawk.

These Tillandsia are smaller than at km 80 $\frac{1}{2}$, and many more dead ones (terminal part dead, not just stems). Some old ones with 18" of dead stem have tiny little plant at end. Very few with pink flowering stalks. Small snail shells mixed in sand at various places.

Temp. 5:30 = 14°, ~~at 7:30~~ 7:30 14°

Saw lots of insects in afternoon. Not many silverfish or big spiders. Saw big black weevil with his proboscis deep in a Tillandsia center roll. Numerous moths, a few big slow-moving flies, no ants here or at km 80 $\frac{1}{2}$ (there are ants in the gully but not up on the slope. Saw burrowing owl; 4 of its pellets were all insect parts, no ~~no~~ fur.

Looked for Gekkos after dark but saw none. Moths flying, big cricket out on bare yellow knoll, no spiders seen, one mosquito. Temp 14°

5 $\frac{1}{2}$ Km. NE San Bartolo, Dept. of Lima

July 20 Temp. at 7:30 13°, foggy. Anita heard lot of last night. Collected insects on the Tillandsia slope (sandy) on south side of Valley. just below area under rocks a large scorpion & large cricket. a new kind of green pupa in silk sheath in center of eaten Tillandsia. Tallest Tillandsia

here are about 14"; many of them in places have rhizomes going 6 inches or more down into the sand. Gecko in "spider" hole in bare sand between Tillandsia.

11 a.m. cloudy ^{air} temp. 15° , sand 3" down 17° , 5" down 17° . at 1:30
cloudy bright with breeze $16\frac{1}{2}^{\circ}$.

more insecting in afternoon. In most places the sand is damp down about 3 inches + nearest non-Tillandsia vegetation is in the gully about $\frac{1}{4}$ mile from the study area. the pepper trees in the gully seem to be spaced about 100 yards apart.* There has been rain since we were here last year, as well as rain upstream. After excavating scores of tempting lizard or gecko holes in the sand, ^{almost always} ~~usually~~ with no results, found a big cricket in one, similar to those collected here and at 80 $\frac{1}{2}$ km this year (but not last year). Burying owl pellets picked up along the wash on south side of valley contained 1 bird, seeds of insects (beetle wings and bits of cricket ~~mandible~~ jaws), no scorpion parts. Last year's owl pellets had lots of what must have been cricket jaws also. Saw two burying owls today, plus sparrow hawk and big booby. The fox footprints here this year and last are tiny (smaller than at 80 $\frac{1}{2}$ km, found one old skeleton and the skull is tiny).

Set 2 traps up in sandy Tillandsia and one around boulders at camp. Caught lizard under flat rock.

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out in totally bare desert.

* There is a dwarf Tillandsia in a few places between the ~~vegetated~~ gulley and the study slope, and a few dwarf Tillandsia reach the lower edge of the latifolia, but not far into it.

Contrasted with $80\frac{1}{2}$ km, this Tillandsia patch has smaller plants ($< 14"$), not infrequently bare rhizomes, not as healthy looking (more dead plants, not as many big + medium spiders as last year at $80\frac{1}{2}$, more water here, more flies here, these ^{Tillandsia} frequently get buried by shifting sand.

July 21

Temp at 7:30 14° , gamma during night, cloudy this morning. Nothing in traps. Found baby pt skull outside of den similar to burrowing owl den in dry wash. a well about 1 km down valley is very deep (6 seconds for dropped stone) with water at bottom. Saw tracks of larger fots.

at ~~80~~ 8 am drove to $80\frac{1}{2}$ km and collected again on the original study area. The Tillandsia on the $80\frac{1}{2}$ km plot are up to 20" high, much larger leaves. many of them show signs of parasitization by the green pupa in the silk case. Saw 2 more big black weevil-bottles feeding on red flower stalks; few numbers of scorpions, definite shortage of big spiders + scorpions

air temp. 10:30 am $17\frac{1}{2}^{\circ}$; soil 3" $17\frac{1}{2}^{\circ}$, 5" $16\frac{1}{2}^{\circ}$, 7" $16\frac{1}{2}^{\circ}$.

* another gecko caught on study area under a piece of

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damp newspaper - surrounded by good Tillandsia mats.
Found one of the big crickets under a Tillandsia mat on the
area and one under a rock just off of the area. no Tillandsia
grazed, numerous with parasite damage. Looked for live
grubs but found none. more sulfur lichen this year
than last (plus drift marks) under tips of drooping Tillandsia
leaves this year but not last).

at noon drove to the lava east of Papi's Iron
Tree. Lots of lily plants but no blooms, much drier (!)
than last year and actually sunny for most of the hour
that we spent there repacking and drying the traps. Lots
of big crickets walking around, some chirping. One came to
Orange peel and fed.

Fort droppings picked up close to the study area
at 80 1/2 km contained 1 Phyllotis, 2 lizards,
and numerous crickets; probably one scorpion.

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